Preface

The Paper and Board Industry Advisory Committee (IAC) was formed in 1979 to advise the Health and Safety Commission (HSC) on matters concerning the paper and board industry. It saw a need for guidance in aspects of safe materials handling — in particular reels and sheets of the finished product and bales of raw material.

This document forms part of this guidance which, it is hoped, will assist mills in meeting their legal obligations in relation to the handling of reels of paper and board. It has been prepared in consultation with the Health and Safety Executive (HSE) and should be read in conjunction with the appropriate parts of the Factories Act 1961 and the Health and Safety at Work etc Act 1974 (HSW Act). It should not be considered either as exhaustive or providing the only method of achieving safety.

The Paper and Board IAC will review the interpretation and development of this Guidance which was produced by a subcommittee appointed in 1980. The initial terms of reference of this subcommittee were:

"To prepare guidance on the prevention of accidents during the handling and storage of reels of paper and cardboard within the curtilage of the mill and warehouse."

Introduction

1 This guidance is intended for use in all premises concerned with the manufacture and storage of paper and board. Mills vary not only in type of product but also in size and age and for this reason the advice which follows has been couched in general terms. It is strongly recommended that this document be made available to all employees involved with materials handling.

2 Records show that the movement of reels and the handling and use of associated equipment has been responsible for many serious nonmachinery accidents. This may not be altogether unexpected in view of the frequency with which reels of paper weighing several tonnes are moved by mechanical or manual means, but there are many instances where accidents could be eliminated by a concerted effort to institute safer systems of work or to provide more suitable plant and give adequate training in its correct use. Examples of check lists for both the preparation and assessment of a safe system are available in the IAC guidance *Safe systems of work for paper making machines.*

Legal requirements

3 The main safety legislation related to this industry is contained in the Factories Act 1961 and the Health and Safety at Work etc Act 1974 (HSW Act). Only requirements relating to materials handling are dealt with here. For more detailed information on legal obligations reference should be made to the appropriate Act or Statutory Instrument.

4 Within the mill and associated warehouse the full requirements of the Factories Act and the HSW Act must be met in addition to any special regulations which may apply to specific processes. In a building outside the mill curtilage and used solely as a warehouse, only certain sections of the Factories Act apply (as given in Section 125) but the HSW Act applies in full.

5 Section 2 of the HSW Act requires employers to ensure so far as is reasonably practicable the health and safety at work of all their employees. This duty includes the provision and maintenance of plant and systems of work and arrangements for handling, storing and transporting articles that are, as far as reasonably practicable, safe and free from risks to health. It also includes the provision of all necessary information, instruction, training and supervision. This section also places a duty on employers to consult persons who have been appointed, in accordance with the Safety Representatives and Safety Committee Regulations 1977, to represent employees on health and safety matters. Section 3 of the same Act imposes a further duty on an employer. He must ensure that, so far as reasonably practicable, persons other than his own employees are not exposed to risks to their health and safety arising from his undertaking.

6 Employees have duties placed on them by Sections 7 and 8 of this Act to take reasonable care for their own health and safety. They must also ensure that the health and safety of others will not be adversely affected by what they do or fail to do. Employees must also cooperate with their employer to enable him to carry out requirements imposed by law and must not interfere with or misuse anything provided in the interests of health and safety.

7 The Factories Act 1961 is more specific in its requirements in relation to materials handling. Section 72 prohibits a person from being employed to carry any load which is so heavy as to be likely to injure him. Lifting tackle (chains, ropes, hooks, shackles etc), and lifting machines (cranes, pulley blocks, gin wheels, crabs, winches etc) are dealt with in Sections 26 and 27 of this Act which require that this plant and equipment shall be of good construction, sound material, of adequate strength, free from patent defect and properly maintained. These sections also require that these items are tested and thoroughly examined by a competent person (who must issue a certificate to this effect) before being taken into use and specify maximum intervals which may elapse before re-examination, i.e. within 14 months for cranes and lifting machines, and six months for chains, ropes and lifting tackle. Reports of such examinations containing prescribed particulars must be kept. Full details of these are contained in the Lifting Machines (Particulars of Examination) Order 1863 and the Chains, Ropes and Lifting Tackle (Register) Order 1938.

8 The safe working load (SWL) must be plainly marked on every lifting machine unless, as with a jib crane, the safe load may be varied by the raising or lowering of the jib — in which case there must be attached either an automatic indicator or a table showing safe working loads at corresponding load radii. A table showing the safe working loads (including in the case of multiple slings the loads at different leg angles) of all chains, ropes, and lifting tackle must be posted in the store where such items are kept and in prominent positions on the premises unless the information is plainly marked on the item. All

equipment used for lifting operations must carry some distinguishing number or mark.

9 Where anyone is working in a place above floor level where he could be struck by an overhead travelling crane or by its load, effective measures must be taken to warn him of the crane's approach unless his work is so dependent on the crane's movements as to make a warning unnecessary. Effective measures must also be taken by warning the crane operator, or by taking other precautions, to ensure that an overhead travelling crane does not approach within 20 ft of any person working near the wheel track.

10 Sections 22, 23 and 25 of the Factories Act relate to the use of hoists and lifts. For a lifting machine or other appliance deemed to be a lift or hoist within the requirements of these sections it must have a platform or cage whose direction of movement is restricted by a guide or guides.

11 In general, liftways must be protected by an enclosure fitted with gates. This should prevent anyone falling down the liftway or coming into contact with any moving part of the lift. Gates must be interlocked to ensure that they cannot be opened unless the cage is at that landing, and that the cage cannot be moved unless the gate is closed.

12 Hoists and lifts are also subject to regular examinations (six monthly) by a competent person who must issue a written report within 28 days.

13 The Hoists Exemption Order 1962 permits certain exceptions from the requirements of Sections 22 to 25. For example the lowerator which is dealt with in paras 48 and 49 need not have interlocked gates at the loading or unloading point provided other effective steps are taken to prevent persons from falling down the liftway or coming into contact with moving parts.

14 The Docks Regulations 1934 apply to the loading or unloading of any ship or vessel at any dock, wharf or quay. This activity often takes place within the curtilage of a paper mill or warehouse and it is necessary to consider the requirements of this legislation in relation to materials handling. Standards similar to those discussed under the Factories Act are set out as regards construction, use and examination of lifting machinery, chains, ropes and other lifting tackle. The main difference is the requirement for cranes and winches to be provided with some means of reducing to a minimum the risk of accidental descent of a load whilst it is being raised or lowered.

Housekeeping, interim storage and layout

15 Good housekeeping is an important factor in reducing accidents in the industry. The essential requirements include:

(a) keeping floors of working areas clean, tidy and free from items not required for immediate use;

(b) providing adequate interim storage in suitable, well defined places in the work area for items such as wedges, shells, lifting tackle, and other equipment required to be close to hand for use at any time;

(c) avoiding interim storage of reels in work areas where this may endanger persons operating adjacent machinery;

(d) preventing the accumulation of broke outside areas set aside for broke disposal.

16 Gangways and storage areas should be clearly marked and of adequate size. Where lift trucks or other mechanically propelled vehicles are used, separate clearly defined pedestrian gangways should be provided whenever space permits. Further advice on this subject is contained in guidance note GS9 *Road transport in factories* published by the Health and Safety Executive.

17 Storage should be regarded as part of the production process and space designated accordingly. Interim stacking and storage of reels between stages in the process should be carried out in accordance with recommendations given in paras 59 to 74 (which refer in general to final storage prior to despatch). This is particularly important in the area of the reel-up on the making machine (where space for manoeuvring is absolutely essential) and in any other area where a build up of reels can occur as a result of a hold up in the process.

18 Removal of paper from shells and splitting of reels should preferably be carried out immediately before feeding into the beater, pulper or other broke disposal unit. When this is not possible, steps should be taken to ensure that this paper is removed immediately to a designated storage place.

Overhead travelling cranes

19 Safe systems of work are required for the operation of overhead travelling cranes. In particular, these should refer to:

(a) the use of trained personnel;

(b) the use of proper equipment;

(c) the numbers needed for a safe operation;

(d) the coordination between those involved;

(e) the safety of others who may be working in the area where lifting is taking place.

20 All crane operators and slingers must be properly trained and competent in lifting procedures and should understand the company rules which apply to them. An example of a set of rules for crane operators as used in one mill is given in Appendix 1.

21 It is recommended that all candidates for training as operators should first be health screened to ensure fitness for the job. This screening should be under the direction of a medical practitioner and particular attention should be paid to physical fitness to do the job — especially mobility and quality of eyesight and hearing. Crane operators should be issued with a company authority following successful completion of training.

22 Regardless of the width and diameter of the reels a yoke or spreader lifting beam (Fig 1) should always be used for removing a shell mounted reel from, or placing it into a machine. This will give greater control and accuracy in locating bearings. Where non-shell mounted reels are handled slings or grabs as shown in Figs 9 to 16 should be used.

23 When heavy lifting equipment such as a spreader beam or grab is used the combined weight of this and the material being lifted should be within the marked safe working load of the crane. The equipment should be clearly marked with its own weight and safe working load.

24 The equipment used to lift reels while still revolving has to take account of the tendency for the reel/shell to climb out of the hook. The flat hook (Fig 2) has been specially designed with a deep throat for this purpose and Figs 3 to 6 show alternatives.

25 The number of persons involved in a lifting operation will *partly* be determined by the crane operator's field of vision and particularly his ability to see whether both ends of the lifting equipment are fully engaged immediately before beginning the lift. Cranes operated by pendant electrical push button controls may allow the operator greater freedom of movement and therefore better visibility than those where the 'tram type' controllers are operated by wires or ropes

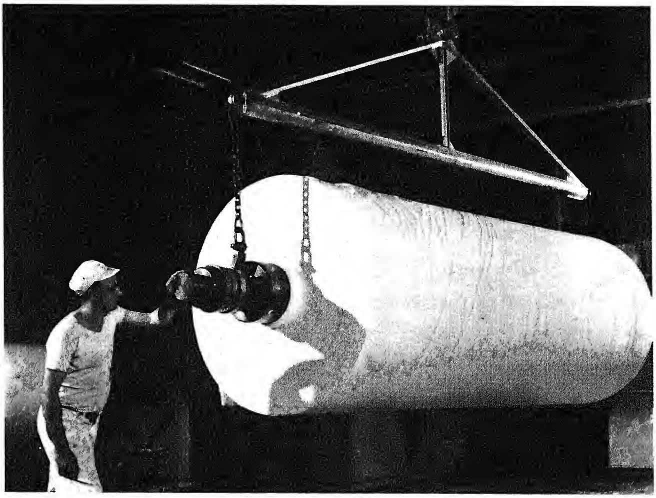


Fig 1 Spreader lifting beam used for moving shell mounted reel

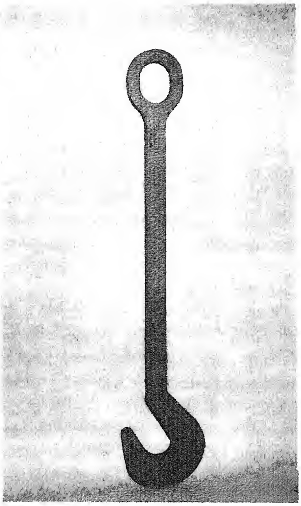


Fig 2 Plate hook with deep throat

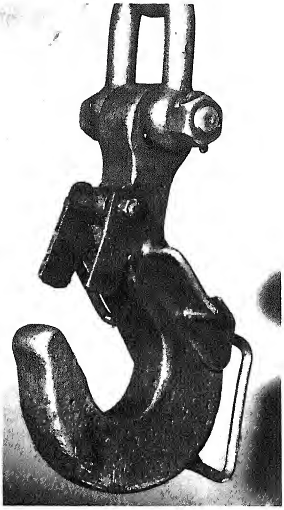


Fig 3 Hook with safety catch

suspended in a framework (mechanical pendant) as shown in Fig 7. The safe system must identify the circumstances in which lifting can only be carried out safely with the assistance of slingers. Loads lifted by an operator in an overhead cab will always need slingers to attach the lifting tackle. Where the crane operator is able to assist with slinging his duties must be clearly defined.

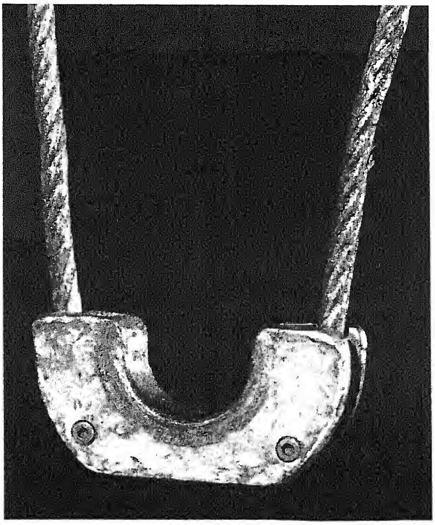


Fig 4 Sling with built in bronze bearing block

26 A clear system of signals must be established for the use of slingers and crane operators, details of which should be prominently displayed in all areas of crane operation. An example of a suitable signalling system is given in Appendix 2. One person only on each lifting crew should be designated to give signals to the crane operator although in the case of 'emergency stop' the operator should react to *anyone* giving the signal. No reel should be lifted until persons in the area are clear and no one should be underneath the path of a suspended reel.

27 When overhead travelling cranes are used for reel stacking, adequate clearance must be maintained to ensure that a person necessarily on top of the stack cannot be struck by a passing crane. Steps should be taken to ensure that exposed electrical conductors for cranes cannot be touched by anyone standing on any part of the stack and means of giving warning of approach by the crane should be provided. For example a flashing light, klaxon or bell should be fitted to the crane, or a whistle may be provided for the crane operator if this is more appropriate.

28 A high standard of maintenance is necessary for overhead cranes and a planned programme of servicing between statutory examinations is essential. This is particularly important where cranes are in use for 24 hours per day as the useful life of the hoist rope may be reached very rapidly under arduous conditions and rope failure can occur. Regular inspections of hoist ropes and crane controls by mill technical staff will assist in detecting early signs of failure and will help prevent accidents. The frequency of these inspections should be agreed between the mill staff, the rope supplier and the appointed competent person.

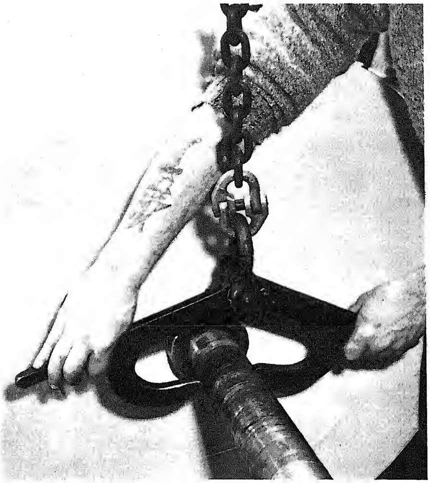


Fig 5 Hinged double hook which . . . .

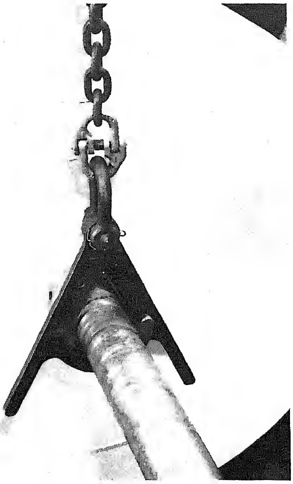


Fig 6 . . . . automatically closes and traps the journal

29 On most overhead cranes only the upper limit switch is provided and this is often positioned within a few centimetres travel of the 'two-block' position (i.e. where there is no slack rope between the blocks). Reliance should not be placed on this switch as a regular means of stopping the lift as in the event of its failure the operator has little chance to take corrective action before the two-block condition is reached with almost inevitable failure of the hoist rope. A manually reset switch should be fitted as this will discourage its use for routine stopping of the lift. If normal operation necessitates this being approached frequently (and particularly where there is low headroom) it is advisable to fit two upper travel limit switches. The first one to operate may be self resetting but the second one should require to be manually reset before the crane can be used again.

Telecommand controlled cranes

30 The movement of the hook and crab may be controlled by radio, induction or other nonconductive means emitted from a small mobile transmitter and without the need for a direct physical link with the crane, the operator is able to take part unhindered in slinging operations. The optimum viewpoint can therefore be chosen for operations requiring accurate positioning.

31 Important design features for these cranes are given at Appendix 3. They include a means of limiting the range of operation and a facility whereby the crane will respond only to the specified signal.

32 The limiting range feature should be thoroughly tested at intervals by a suitably trained person. In addition it should be checked at the beginning of each shift to ensure that it is in accordance with the limits specified for its operation.

33 To prevent unauthorised use, the operators of telecommand controlled cranes should:

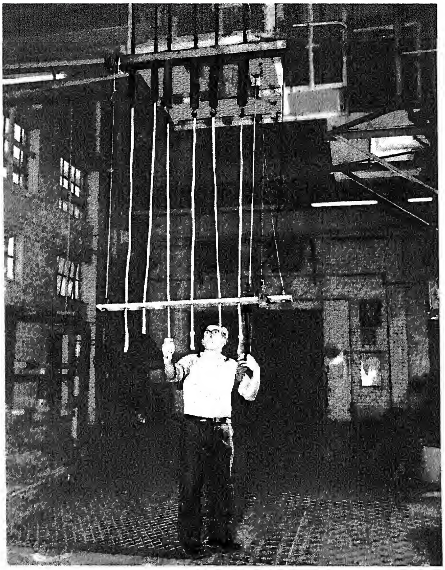


Fig 7 Tram type (mechanical) pendant controls for overhead crane

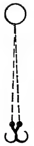
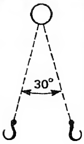
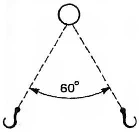
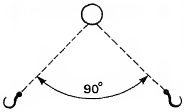
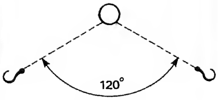
Two leg sling — 3 tonnes max lifting capacity				
				
tonnes	tonnes	tonnes	tonnes	tonnes
3.0	**2.9**	**2.6**	**2.1**	**1.5**

Fig 8 Example to illustrate how load carrying capacity of a two leg sling decreases as the angle increases.

(a) retain the transmitter in their physical possession; or

(b) remove the key from its switch and, for short periods, retain the key in their possession; or

(c) for longer periods, or when the crane is not in use, deposit the transmitter in safe storage.

Provision should also be made for the security of the transmitter when the crane is not in use.

34 When the transmitter is fitted with a belt or harness, the operator should be wearing it before switching on the transmitter so that accidental operation of the crane is prevented. The transmitter should only be switched on when operating the crane and should be switched off before removing the harness.

Slings and grabs

35 A variety of slings and grabs is used in the industry and some examples are shown in Figs 9 to 16.

It should be remembered that the load carrying capacity of a two leg sling decreases as the angle between the legs increases. An example of this is shown in Fig 8.

36 There is a legal requirement that all slings whether chain, wire rope or fibre rope must be of adequate strength and be well maintained. A table showing the safe working loads of slings must be posted in the lifting tackle store and in prominent positions on the premises. It is advisable to have this information marked on the slings as well. A system of inspection should be instituted to ensure that only slings in good condition remain in use. Where slings are received as part of a preslung load the slings should not be reused unless they have been properly certificated and comply with these requirements.

37 Rope slings of the type shown in Fig 9 cannot be used when building or taking down pyramid stacks, but may find an application in horizontal parallel block stacking. Plug slings shown in Figs 10 and 11 are of limited application in stacking as insertion and removal of plugs on the stack is potentially hazardous. The operation involves a slinger on the stack leaning around to the side of the reels to insert or remove the plug. Similar problems arise in the insertion of ropes through cores as shown in Fig 12 and this practice should be discouraged. Wherever practicable an alternative type of sling, grab or lifting method such as, for example, those shown in Figs 13 to 16 is recommended as being the safer method.

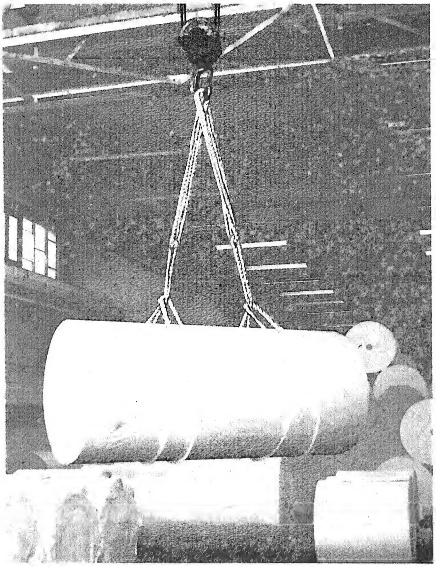


Fig 9 Continuous rope slings lifting a reel

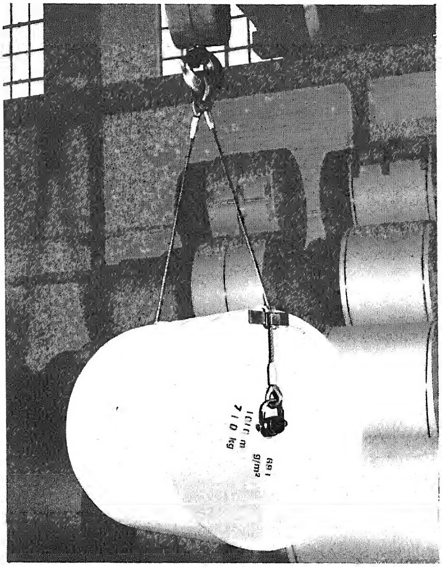


Fig 10 Plug sling lifting a reel with . . .

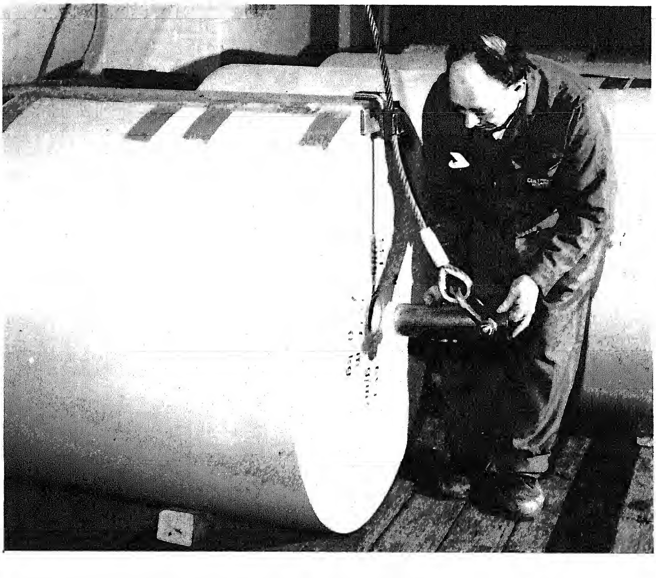


Fig 11 . . . plugs inserted in each end of core

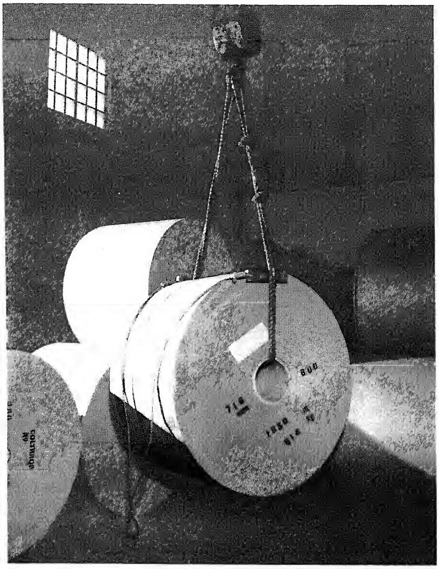


Fig 12 Rope passed through reel core

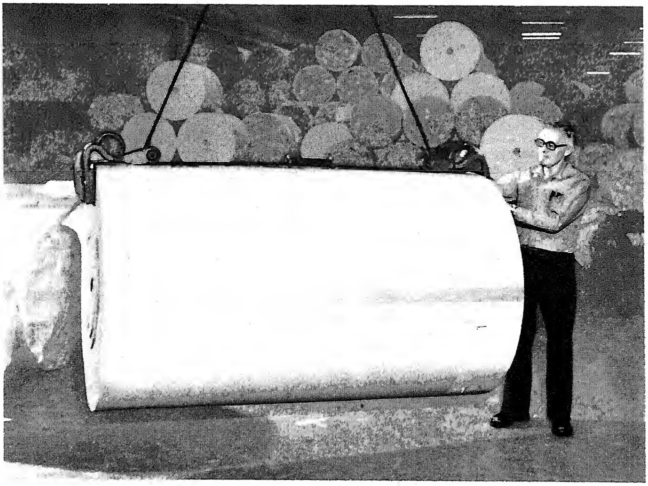


Fig 13 Wire operated grab lifting a reel

38 One advantge of the scissor grab is that it can eliminate the need for the slinger to climb on the stack. This may be achieved by using an automatic opening/closing type (Fig 14) or by operating the toggle mechanism of the manual type (Fig 15) from floor level using a cord or pole. Scissor grabs may grip the reel over either the diameter or the end faces (as shown in Fig 16) and are designed so that the weight of the reel keeps the grab closed.

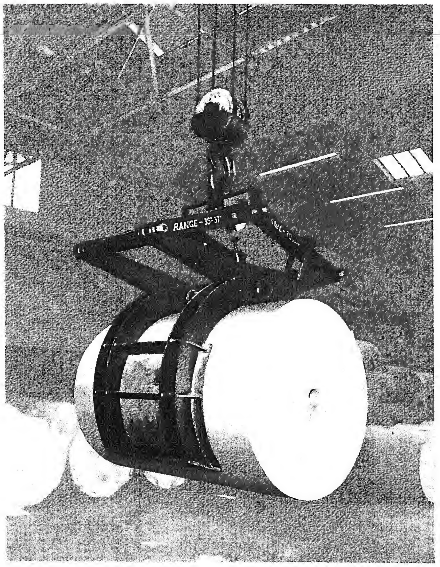


Fig 14 Automatic scissor grab lifting a reel

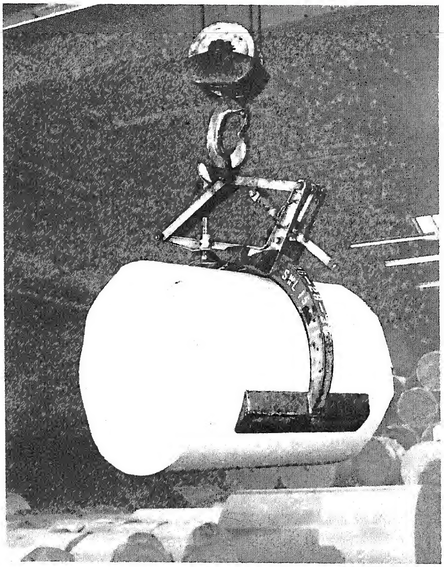


Fig 15 Manually operated grab lifting a reel

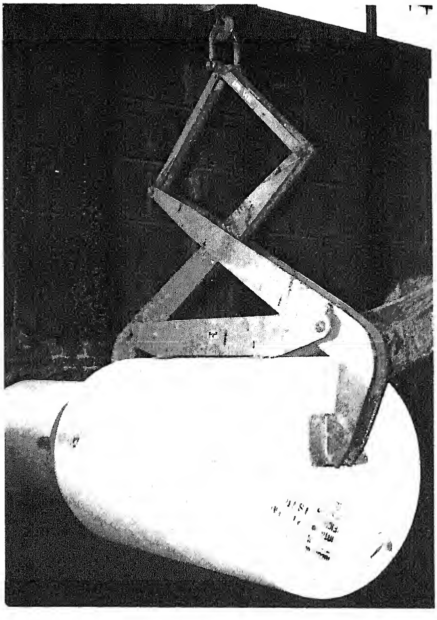


Fig 16 Scissor grab which grips reel and faces

39 The following points should be noted in using scissor grabs:

(a) each grab is designed to work over a restricted range of sizes of reel (usually ± 50 to 80 mm on the diameter or deckle width). It is important that the correct grab is used and that the supporting pads are correctly set for the diameter of reel to be lifted;

(b) a visual indicator should show that the grab linkage is correctly adjusted. This may take the form shown in Fig 17 where an area on the inner arm is coloured just above the fulcrum. When the grab is properly adjusted in position on a reel within its capacity this colour is visible above the edge of the other arm. If the colour is not visible or if this colour is not immediately along the edge of the arm the load diameter is outside the specified grab capacity;

(c) the grab should be clearly marked with its tare weight and with its safe working load and diameter range;

(d) roughening the surfaces of the clamping plates may assist in increasing friction and thereby prevent the reel slipping from the plates. If this is done the plates must be regularly cleaned to remove fibres which will adhere during use;

(e) where automatic grabs are used a safety hook must be fitted to the crane to prevent the grab coming free when it is dropped on to the reel or the reel is 'bounced' to release the grab;

(f) two reels may be lifted together with a grab which has one plate on each arm provided that this meets the manufacturer's specifications. If the reels are contained within a wrapping this should be marked as described in paragraph 69;

(g) it is essential that reels to be handled using scissor grabs have either firm wrappings or the ends secured. This will help prevent the reel from slipping within the wrapping or outer layer. Particular problems of reel slippage may arise with polythene or similar polished wrappings.

Fork lift and reel clamp trucks

40 Systems of work for the selection and operation of trucks should be established and everyone involved in truck operation should be aware of them. All operators should be trained in accordance with a recognised scheme such as that issued by the Road Transport Industry Training Board. It is recommended that all candidates for training should first be health screened to ensure fitness for the job. This screening should be under the direction of a medical practitioner. Particular attention should be paid to physical fitness to do the job — especially mobility and quality of eyesight and hearing. This can usually only be satisfactorily established by a physical examination.

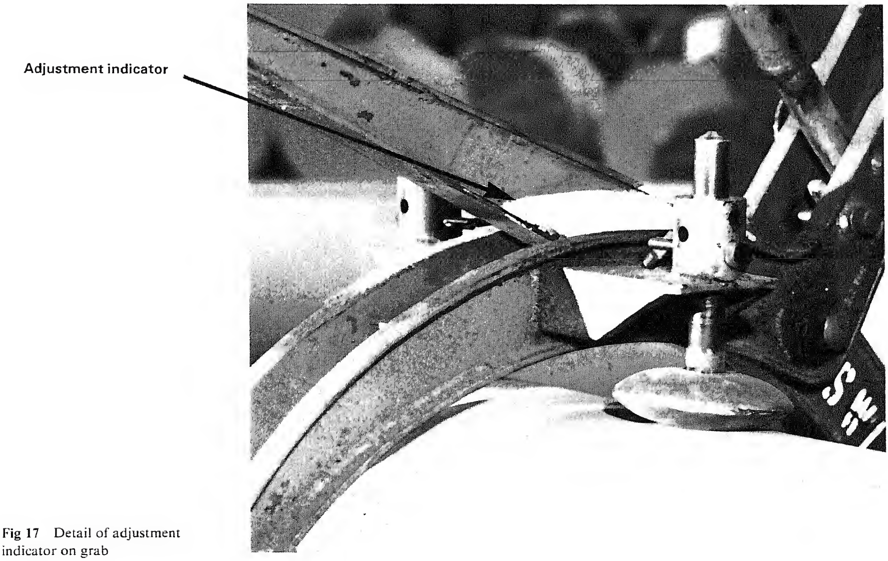


Fig 17 Detail of adjustment indicator on grab

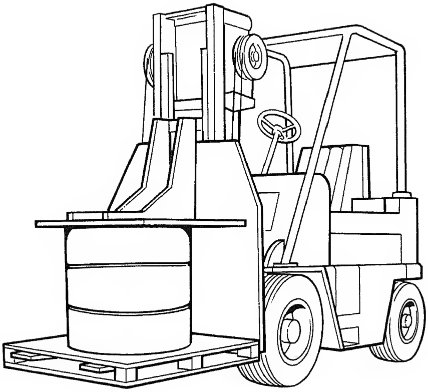


Fig 18 Clamp retaining the load on a pallet being carried by a forklift truck

41 Following satisfactory completion of training, operators should be issued with a written authority from their employer which should contain a set of essential rules such as those shown in Appendix 4. The retention of the authorisation should depend on the satisfactory performance of truck driving duties and the maintenance of good health as confirmed by periodic examinations.

42 Operating areas should be clearly defined and properly laid out. An important consideration in the use of fork lift and reel clamp trucks is the provision of adequate stacking aisles, the width of which may be calculated as shown in Appendix 5. Where space allows the area should be marked out with zebra crossings and other road markings to separate trucks and pedestrians. Other safety features such as mirrors at junctions and corners may usefully be employed to improve safety at these points. Consideration should also be given to the fitting to vehicles of some form of continuous warning of approach such as a flashing light.

43 Proprietary and purpose built trucks and attachments for fork lift or clamp trucks are used for reel handling. Some examples are shown in Figs 18 to 21 and Appendix 6. If attachments are supplied separately the advice of the truck manufacturer should be sought first to ensure that they are suitable and to establish the effect on the truck rating. If the rating is affected, it should be brought to the attention of the operator.

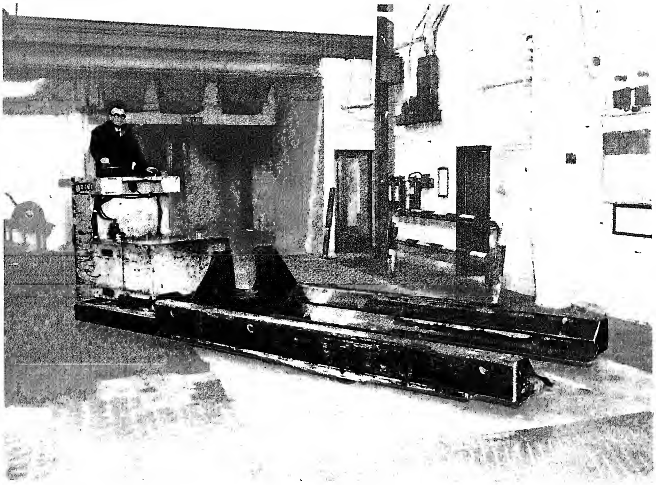
44 The Health and Safety Executive has published a booklet HS(G)6, *Safety in working with lift trucks* which covers these recommendations in more detail and would be a useful reference for all truck operators.

45 Lift trucks are increasingly used as a means of access to elevated points such as the top of reel stacks. Section 29 of the Factories Act 1961 and Section 2 of the HSW Act both require safe means of access to a place of work to be provided and maintained. HSE has published a guidance note (PM28) which gives advice on the use of platforms on lift trucks. Although intended primarily for situations where work is carried out from the platform, the precautions outlined in this publication provide an acceptable standard for using the trucks as means of access.

Conveying equipment

46 There are various other systems for conveying reels from place to place. Of the two main manual systems, the simplest is a wheeled bogie and the other is

Fig 19 10 Tonne capacity reel carrying truck



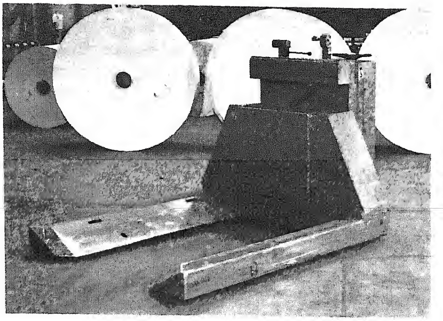


Fig 20 Four Tonne capacity reel carrying truck which . . .

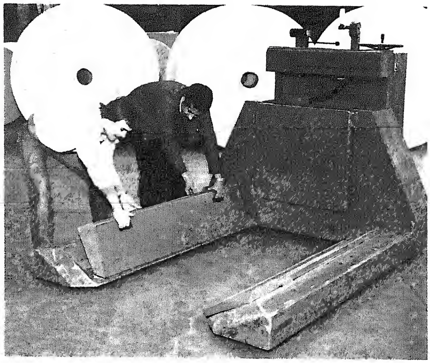


Fig 21 . . . can be modified to carry reels of smaller diameter

a trolley mounted on a track which is sunk in the floor as shown in Fig 22. Usually, these are purpose built for the individual situation and should be suitably designed, constructed and maintained and be clearly marked with their safe working capacity. Powered systems are also available and where these are remotely controlled, it is essential that traps between moving load and fixtures be avoided. Where operators are likely to be crossing the track of a remotely controlled system, warning should be given before it is started and, where appropriate, the approach of the trolley should be indicated.

47 The reel must be effectively restrained when on the trolley to prevent it rolling off. This can be accomplished by proper design of the trolley or by fitting wedges to keep the reel in position. It is also essential that mechanical trapping points on the conveyor, are fully guarded and that the system is maintained so that the reel carrying trolleys remain stable.

48 For transferring reels between floors, a type of lift known as a lowerator or de-elevator is often used. In appearance it resembles a conventional lift but reels are loaded or unloaded automatically (Fig 23). Paragraph 13 explained that there is an exemption to the requirement to provide interlocked doors for these lifts. Dangerous moving parts may be individually guarded, but this is difficult where parts of the reel platform pass close to the landing — particularly where these take the form of interfitting fingers to aid automatic transfer (Fig 24). On some of these paternoster type lifts the platforms themselves prevent a person from falling down the way, but this may not be so if the reel rests only on well spaced support arms. In practice the best method of achieving both of these requirements is to fit interlocked doors at the landings. The interlocking

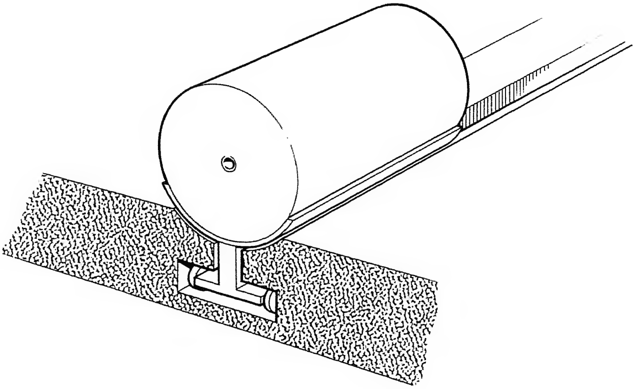


Fig 22 Reel conveyor trolley mounted on a sunken track

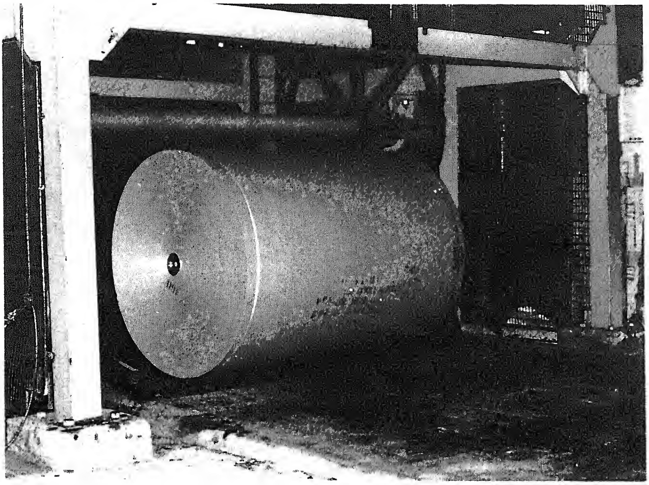


Fig 23 Reel is unloaded automatically from the lowerator platform

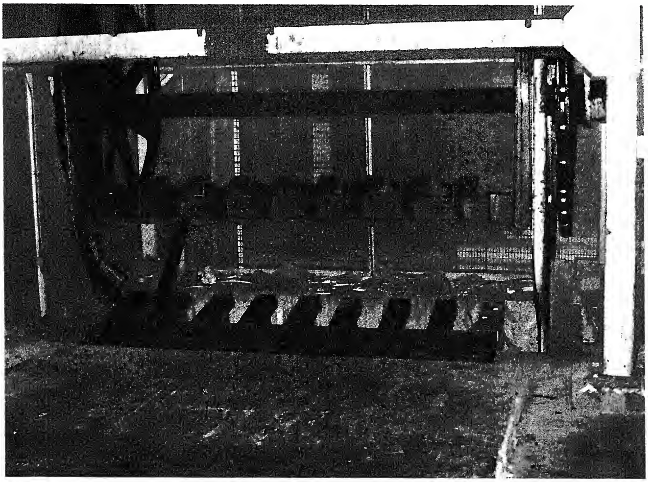


Fig 24 Interfitting fingers forming the lowerator platform aid automatic transfer

mechanism may be actuated by the reel which itself automatically opens the door for access to or from the lift. Where small diameter reels are handled a tunnel may be installed which allows movement of the reel to and from the platform but restricts the entry of persons. The use of pressure sensitive mats, load sensing cells and capacitance or photo-electric devices may also be considered appropriate in some instances.

49 Apart from the danger of falling down the shaft or coming into contact with moving parts the greatest hazard is one of being hit or crushed by a reel as it comes rolling out of the lowerator following automatic ejection. To safeguard against this, access to the area should be restricted by fences and some braking device should be installed to limit the free travel of the reel. It is also preferable that a device is incorporated to give automatic warning when a reel is about to be discharged.

50 For transferring reels between lower levels, a scissor lift may be used. The potential hazards associated with these lifts relate to trapping at the platform edge; between the scissor arms and underneath the platform as it descends. British Standard code of practice BS 5323: 1980 recommends design and safety requirements.

51 Unless it is totally enclosed by a rigid guard, or is otherwise safe the underside of the platform on all power operated scissor lifts should be fitted with a peripheral safety trip or similar device. This should effectively prevent the trapping of any obstruction beneath the platform during its descent. When non rigid types of enclosure are used it may be necessary to fit in addition a safety trip frame around the lower edge if the danger of trapping by the platform remains. It is important that electrical limit switches fitted in connection with the peripheral safety trips should comply with the requirements of the British Standard.

52 Newly manufactured scissor lifts should incorporate the safety features outlined in BS 5323, particularly the 30 mm minimum clearance between adjacent scissor arms and the 50 mm horizontal clearance between scissor arms and platform or base frame. This minimum clearance between scissor arms is 10 mm greater than the dimension previously recommended. It will usually be impracticable to modify older lifts to the recommended horizontal clearances, and in such instances some form of total enclosure of the space beneath the platform will be necessary, unless the installation renders the scissor arms safe by position. If the recommended horizontal clearances are provided and suitable peripheral safety trip frames are fitted at the underside of the platforms of power-operated lifts total enclosure should not be necessary.

53 All scissor lifts should be provided with a manually operated scotch or other equally effective means to enable them to be mechanically locked in a raised position in order to prevent persons being trapped under the platform during maintenance or repair work. This is an essential requirement and it should be ascertained that a clearly identifiable scotch is permanently available at the lift and that suitable warning labels are permanently fixed in prominent positions. The labels should indicate the position for using a scotch such that it cannot be forced out by the scissors action.

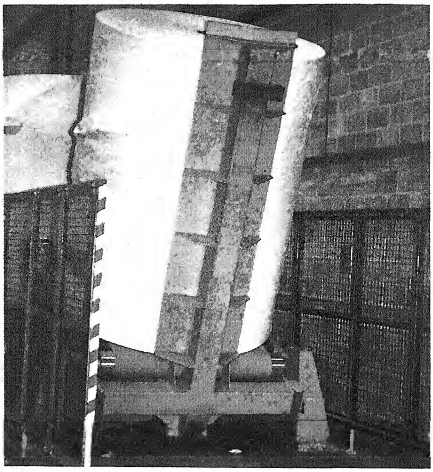


Fig 25 Reel up-ending device

54 An alternative to the rotating clamp attachment on trucks for turning reels onto their end or side is the reel up-ender similar to that shown in Fig 25. It is used mostly for turning reels up onto pallets. These are power operated and there is a danger of a foot being trapped between the underside of the platform and the floor. This may be overcome by using a peripheral trip device as described in para 51. Fixed side guarding may also be used where reel access is not required.

Lorries and trailers

55 Detailed information on the general use of lorries is given in the code of practice *Safety of loads on vehicles*. Loading and unloading are necessary functions within the mill or warehouse and persons employed for this purpose need to be adequately trained. Typical instructions and precautions (which do not claim to be exhaustive) are given in Appendices 7 and 8. Copies of instructions appropriate to the establishment should be prominently displayed in the loading bays or given to the appropriate employees. A sequence for loading/unloading should be established to ensure that a vehicle remains stable. This is particularly important for free standing trailers which have legs or small diameter wheels on short axles at one end.

56 Vehicles used for internal works transport should be in a good state of repair and as safe as those used on public roads. Lorries and trailers which do not meet with the prescribed standards of safety for use on public roads may not be considered to meet the requirements of the HSW Act.

57 A number of serious and even fatal accidents have occurred during the sheeting up of vehicles and this activity should receive special attention. Safe means of access to the top of the load must be provided and this may require the provision of both long and short ladders fitted with safety feet. Where possible, tarpaulin sheets should be placed on the load by a lift truck or crane. As large sheets may be extremely heavy,

consideration should be given to using two smaller ones and a fly sheet if mechanical aids are not available.

58 Falls are often caused by the rope or sheet parting and these should be inspected regularly to ensure that they are in good condition. Nylon and synthetic fibre ropes are more durable than ropes made of sisal or hemp and consideration should be given to using only the former types.

Storage

59 A uniform method of stacking must be adopted within a stack. Under no circumstances should a stack be allowed to contain a mixture of horizontal parallel block and pyramid stacking.

60 The floor of any area used for reel storage should be well maintained and able to support the load. A level surface is preferable but if necessary for drainage or other reasons there may be a maximum slope of 1:66.

61 Wedges should be made of good quality timber. The appropriate angle will vary according to the surfaces in contact. For example an angle of 25° is the optimum for wood/concrete contact but 19° would be better for wood/wood. Wedges should be cut longitudinally with the grain as shown in the sketches (Fig 26). Particular care should be taken to ensure that the reel will not ride over the wedge. Where a single wedge only is used it should conform to the sizes given in Sketch A. If two wedges are used they should be as Sketch B for reels over 550 mm diameter. Below this diameter wedges as shown in Sketch C may be used.

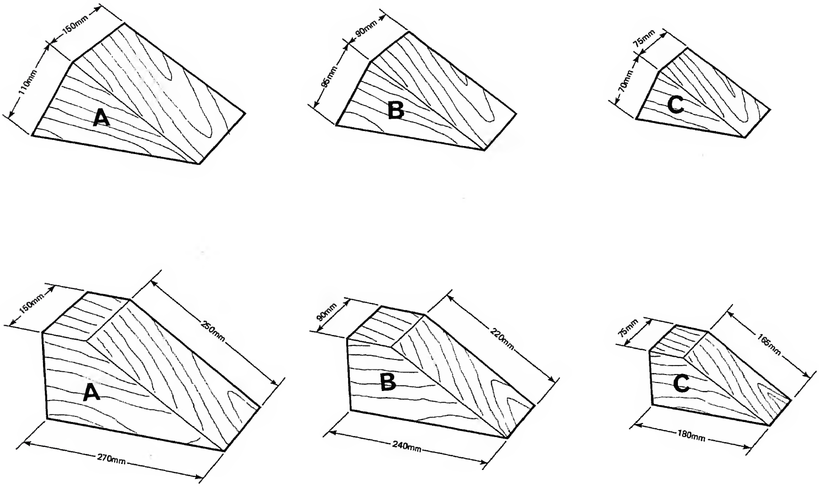
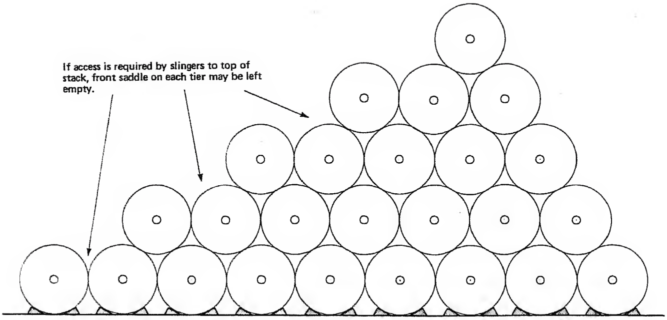


Fig 26 Recommended wedge sizes

Fig 27 Satisfactory pyramid stacking


If access is required by slingers to top of stack, front saddle on each tier may be left empty.

Pyramid stacking

62 The maximum recommended height for a pyramid stack will vary according to the diameter and deckle sizes. Core strength will also have to be considered to ensure that it will not collapse under the weight of reels above it. Plugs may assist by increasing the strength if inserted in the ends of the cores.

63 Whenever reels are stacked in pyramids as illustrated in Figs 27 and 28 they should be of the same diameter and deckle size. An assortment of sizes as shown in Fig 29 can result in an unstable stack with serious consequences especially where a slinger may need to be on the stack. If mixing of sizes cannot be avoided reels of a smaller diameter or deckle may be placed as a single top layer.

64 The base row of pyramid stacks should be retained in position by wedges (with the longest face in contact with the floor) or by bars inserted on end into pockets in the floor. The method used depends on individual circumstances and does not affect safety if a procedure for building up and breaking down is clearly established. The use of wedges has the clear advantage that the base does not have to be of any specific length and storage space is thus saved. Bars should be inserted in the floor at the end of the storage area if this is used as a gangway as shown in Fig 30.

65 The number of wedges will depend on reel size, but at least one wedge of adequate size should be inserted on each side of every reel at floor level. At each end of the stack at least two wedges should be inserted at the outer sides. In addition to maintaining the stability of the stack this will make the process of destacking safer.

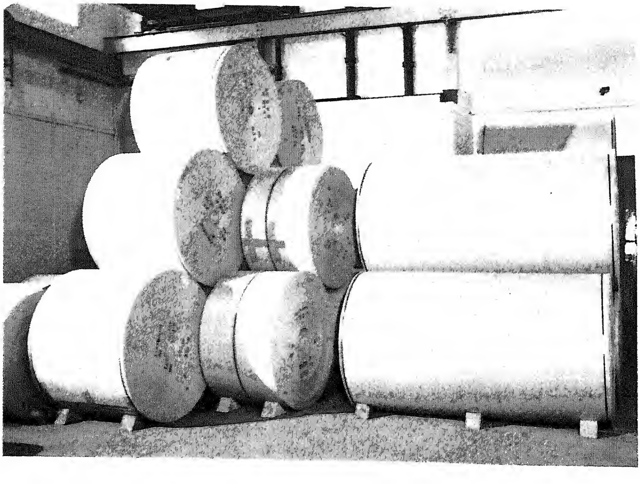


Fig 28 Each pyramid stack only contains one diameter or deckle size

66 Manual breaking down of pyramid stacks using 'podgers' has led to a number of jaws being broken by the free end of the bar when it is forced upwards by a sudden weight on the other end. This method should therefore be strongly discouraged. Where it is *necessary* to adopt this practice a safe system of work incorporating the following precautions should be rigidly enforced:

(a) adequate training should be given to anyone expected to be involved in the breaking down operation;

(b) at least two persons should be involved in the operation — one to assist in taking out the wedge and one to help hold the stack back;

(c) a wedge should be placed *at each* end of reels at ground level as shown in Fig 31;

(d) employees should stand at the side of reels, not in line with them, whilst removing wedges. Alternatively, wedges with handles similar to those shown in Fig 31 may be used;

(e) a 'brake' reel must be put in front to take the momentum of reels as they roll along the floor;

(f) the podger should be pushed away from the body rather than towards it to reduce the risk of the bar coming up under the face;

(g) pyramids which have reels 'bridging' two stacks should *never* be broken down manually.

A correct sequence of operation for manual unstacking is given in Appendix 9.

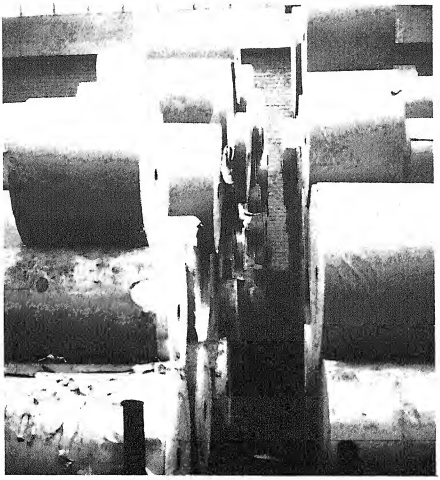


Fig 29 Assorted size reels can lead to stack instability

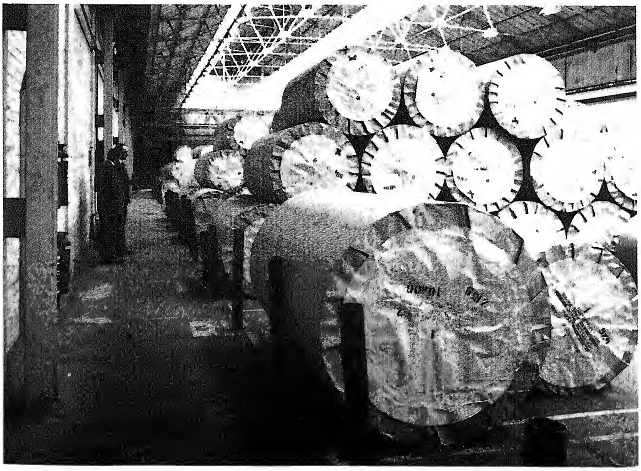


Fig 30 Gangways adjacent to the storage area protected by bars inserted in the floor

Fig 31 Wedges inserted correctly for manual breaking down

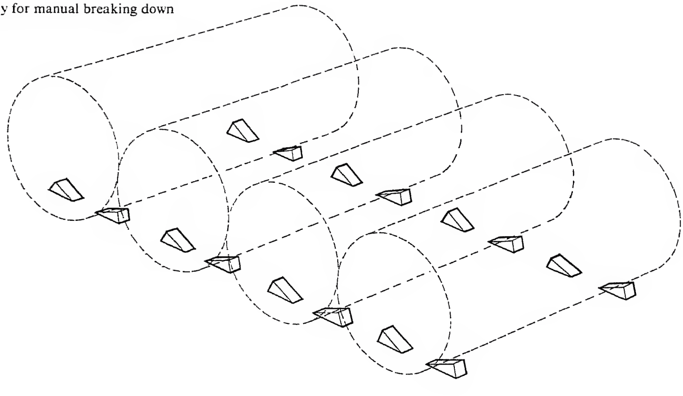


Fig 32 Wedge with handle

End stacking

67 End stacking of reels using reel-clamp trucks requires special training for operators, especially when high lifts are carried out.

68 As with pyramid stacking, the maximum height will depend on deckle and diameter sizes but the stack height to diameter ratio should not exceed 8:1. This ratio will decrease for storage areas which are not purpose built and where pedestrian access is not prohibited. Guidance on the building and spacing of stacks is given in Appendices 10 and 11. Reels should be placed concentrically and should *not* be placed on top of ones of smaller diameter as this can lead to unstable stacks, as Fig 33 illustrates. If they are not wrapped they should be banded, or the ends of the paper secured by sticking or tucking in (see Fig 34).

69 Where two or more reels are wrapped together and are liable to be lifted in a single clamp, each reel must be gripped along a minimum of 50% of its deckle. The wrapper should be clearly marked to indicate this requirement. The number of reels contained within the wrapper should also be clearly indicated as shown in Fig 35.

70 Wrapped reels with ends pleated to the centre should not be stacked on end as the pleating creates a lump at the centre leading to instability. Only reels pleated as shown in Fig 36 (known as a PMA pack) are suitable for stacking in this manner.

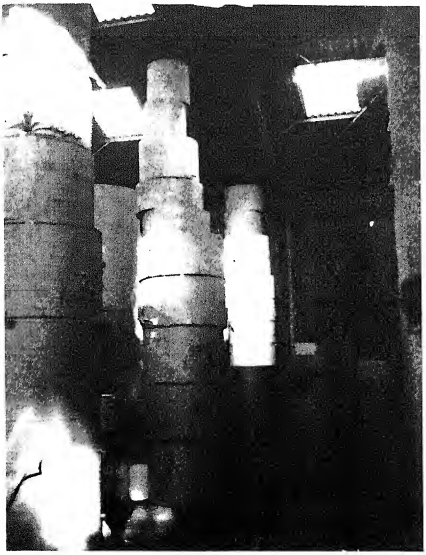


Fig 33 Dangerously stacked reels

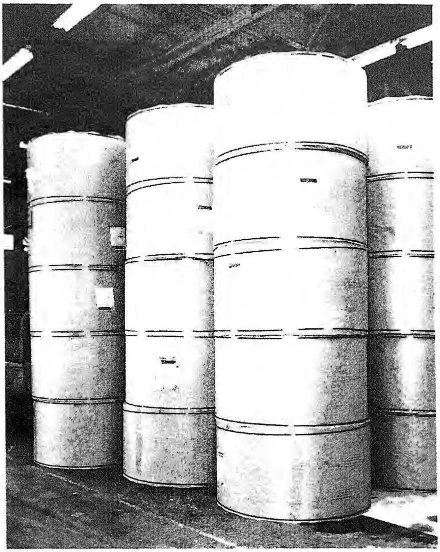


Fig 34 The ends of unwrapped reels secured by banding and sticking

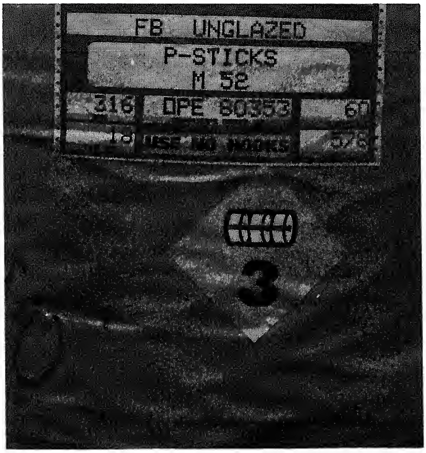


Fig 35 Wrappings clearly marked to show the number of reels contained within

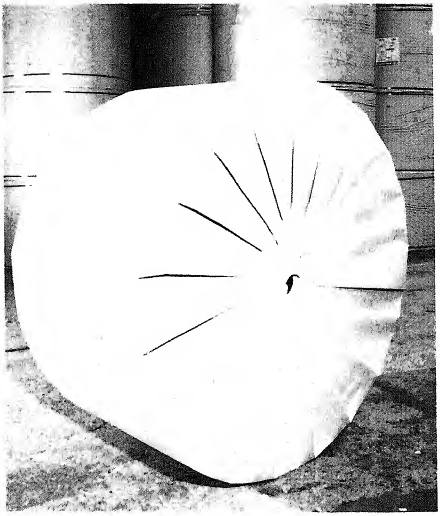
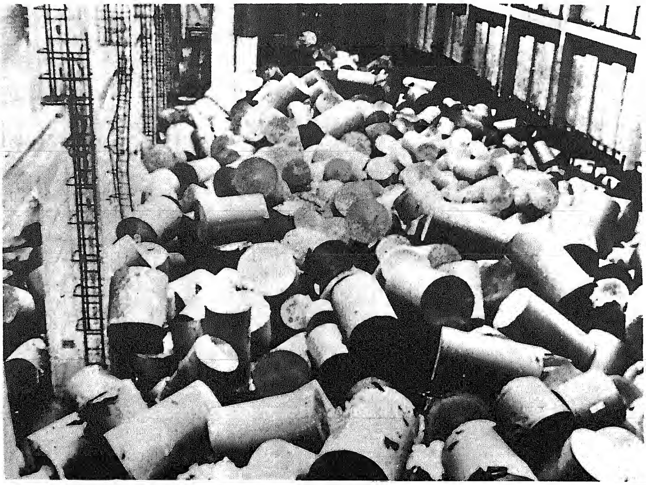


Fig 36 PMA pack suitable for end stacking

Fig 37 The result of a lift truck hitting one stack



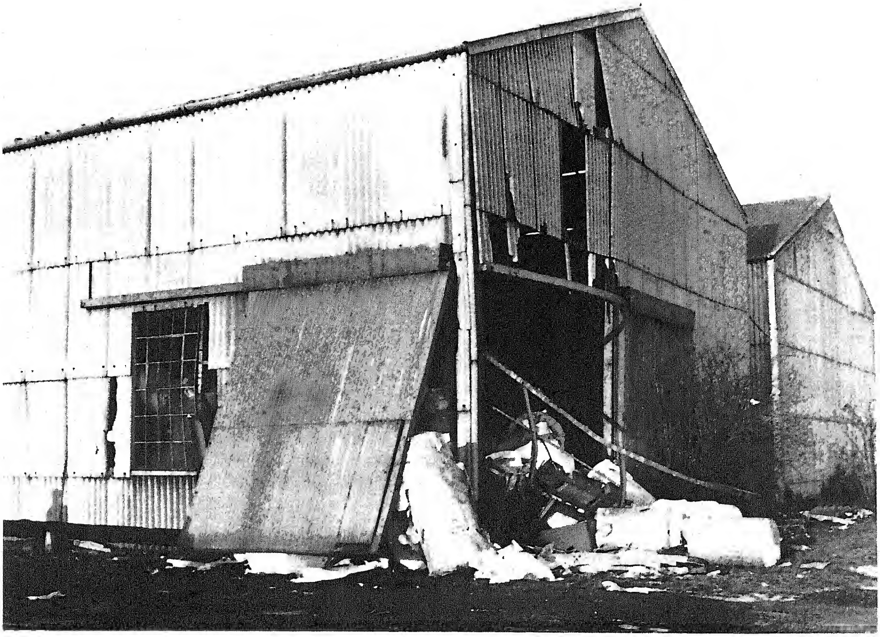


Fig 38 & 39 Damage to building following the collapse of an end stack with subsequent 'domino.' effect.

71 Serious injuries and extensive damage may occur due to the 'domino' effect once a stack falls — as Figs 37 to 39 show. To reduce the possibility of trucks knocking into stacks, the gangway should be as wide as possible. A method of calculating the minimum width is given in Appendix 5.

72 Good lighting is essential in any warehouse used for end stacking. When stacking to or destacking from high levels the lighting should not cause glare for the operators making it difficult to see the precise position of the clamp in relation to the stacks.

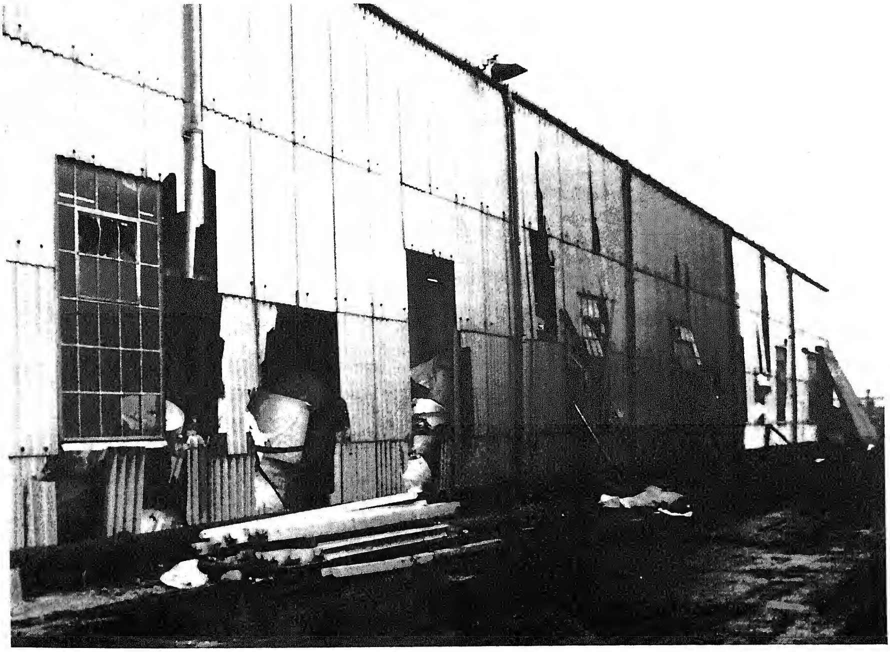


Fig 39

Horizontal parallel block stacking

73 Block stacking of reels on boards as shown in Fig 40 may be considered safe if the following precautions are observed:

(a) to ensure stability the diameter of the reels below the top tier must be uniform and larger deckles must always be below smaller ones;

(b) stacking boards must be sound and of adequate size and strength for the reels being stacked;

(c) reels must be positioned such that they do not overhang the boards by more than ¼ deckle and the centres should be in a vertical line to achieve the best weight distribution;

(d) board ends must be in line with the outside of end reels;

(e) if it is necessary to have more than one board to provide a continuous support, they may be placed side by side at the overlapping point provided the reel overhang from any board is not more than ¼ deckle. If boards are butted end to end, the join should be positioned at the vertical centre of the reel below;

(f) wedging of reels must be as follows:
  (i) all reels of each layer must be wedged on both sides;
  (ii) end reels on each layer must have two wedges on the outsides;

(g) the end faces of the reels should be as near as possible in line to prevent excessive overhang;

(h) the height of the stack must be carefully controlled in relation to deckle size to ensure stability.

74 If the precautions outlined in the preceding paragraph are not rigidly observed potentially dangerous alternatives may be introduced as shown in Fig 42. This can rapidly lead to unstable conditions which can have serious consequences — particularly during destacking.

Pallet Stacking

75 Pallets may be obtained in a variety of designs. They may, for example, have two-way or four-way entry and may be reversible. The faces may be slatted or continuous and they may be intended for reuse or be disposable. In some cases use of hexagonal pallets (as shown in Fig 43) has been beneficial as this facilitates the strapping on of the reel and may allow better support to be achieved by the pallet design. Guidance note PM15 published by the HSE gives information on design and safety in the use of pallets.

76 Pallets should preferably be purpose designed for the type of load they are to carry and the method of storage and transport to be used. If it is company practice to reuse any pallet, a system should be instituted to ensure regular examination and maintenance so that pallets remain in a safe, usable condition.

77 Where pallets of a variety of designs or sizes are liable to be placed in them, racking systems should have shelves rather than runners. This will reduce the possibility of pallets falling through if bearers are not correctly positioned on the shelf runners. Pallets not constructed in accordance with BS 2629 Part 1 or made for single use in non standard sizes should only be racked on shelves. Useful information on the use and design of static racking may be obtained from the Storage Equipment Manufacturers Association publications referred to in the Bibliography.

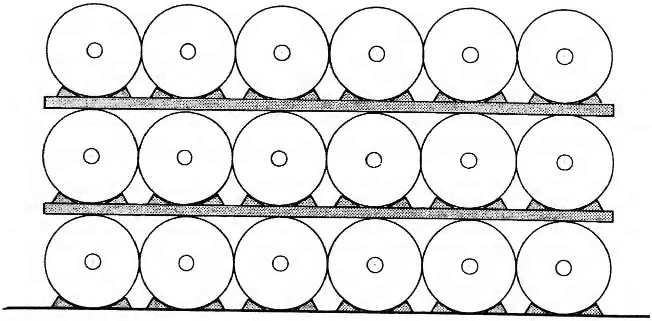


Fig 40 Satisfactory block stacking

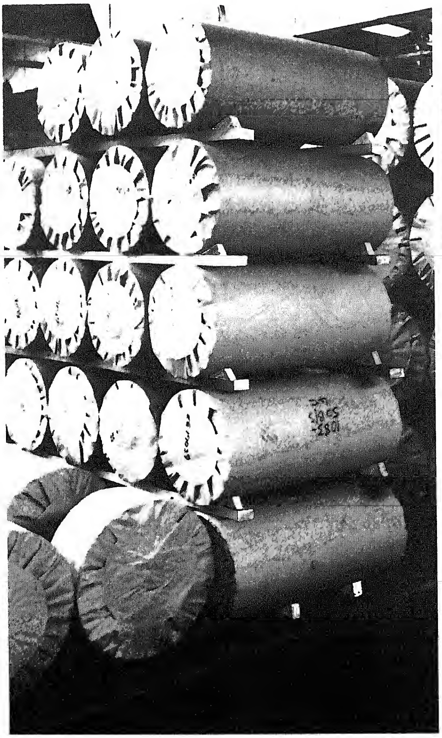


Fig 41 The right way

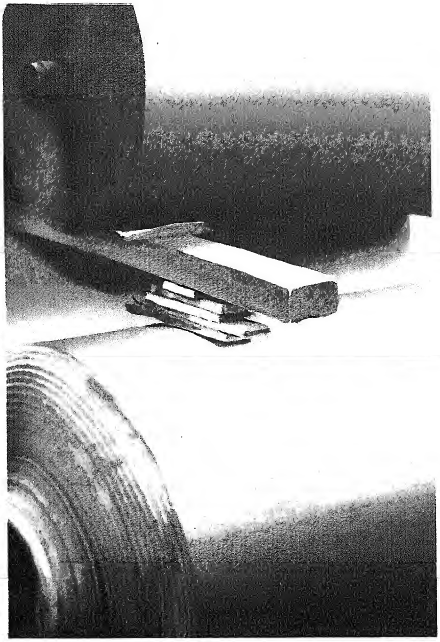


Fig 42 The wrong way!

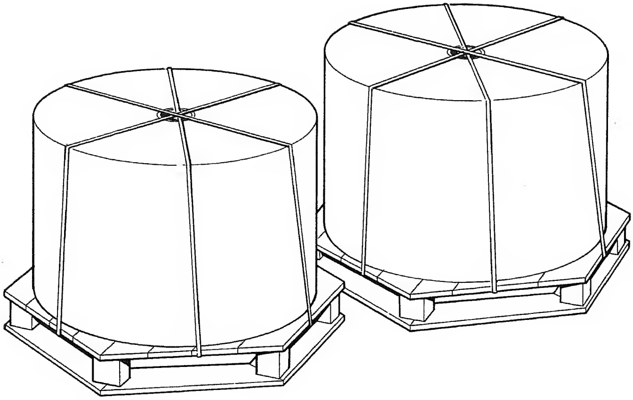


Fig 43 Hexagonal pallet to support reel

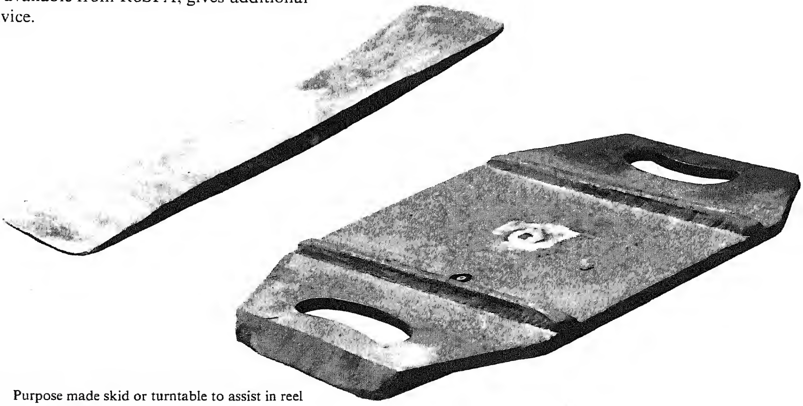
Manual handling and lifting

78 Section 2(2)(b) of the HSW Act makes specific reference to the need to ensure that there is no risk involved in the handling of transport of articles and substances. This requirement applies to manual handling as well as mechanical handling.

79 Manual handling and lifting is any form of activity which entails pushing, pulling, lifting, carrying, holding or moving a load. Back troubles and other injuries can be caused by any of these activities and it is therefore essential that training be given. This should start with first line supervision and extend to the operatives involved in the handling operation. Many factors have to be considered when deciding the maximum load to be moved and examples of these are contained in the leaflet 10M/4/71 available from RoSPA. Leaflet IS/168 also available from RoSPA, gives additional practical advice.

80 Where reels have to be moved by rolling them along the ground, such movement should be confined to short distances on a smooth, level surface. When turning reels round corners purpose made skids or turntables such as those illustrated in Figs 44 and 45 should be employed.

81 Lifting and carrying should preferably be performed by mechanical means. However, if this is not possible the carrying of heavy or bulky loads upstairs should be avoided. Storage racks should be at easy grasp height for the smallest operator and the position for heavy objects which are frequently handled between the knee and waist height should be determined by the tallest operator.



Figs 44 and 45 Purpose made skid or turntable to assist in reel turning

Glossary

Broke	paper rejected during the manufacturing process
Deckle	the width of the paper web
Overhead travelling crane	a crane consisting of a girder or girders, mounted on end carriages which travel along a gantry. The girders support a crab fitted with traversing and hoisting motions.
Paper	includes paper, board and tissue.
Podger	a colloquial term for the bar or lever used to ease out reels whilst breaking down pyramid stacks. Also referred to as a paddle or bat.
Shell	the centre shaft on which paper is wound; also known as a spindle, spool or stick.
Slinger	a person who attaches and disconnects hooks or other attachments to reels or shells during lifting operations. The slinger may also instruct the crane operator on load movement.

Bibliography

Selection and Basic Training of Fork Truck Operators	The Road Transport Industry Training Board, Capital House, Empire Way, Wembley, Middlesex HA9 0NG
Code of practice 4430:1969 *Safety of Powered Industrial Trucks*	The British Standards Institute Sales Dept., Linford Wood, Milton Keynes MK14 6LE.
Code of practice 5323:1976 *Scissor Lifts*	" "
Code of practice 2629:1978 *Pallets for Materials Handling for Through Transit*	" "
Code of practice 5744:1979 *Safe Use of Cranes*	" "
Safety of Loads on Vehicles	Department of the Environment. Available from HMSO and Government Book Shops
Lifting and carrying (HSW booklet No 1)	The Health and Safety Executive. Available from HMSO and Government bookshops.
Safety in the stacking of materials (HSW booklet No 47)	" "
Safety in working with lift trucks (Guidance booklet HSG6)	" "
Road transport in factories (guidance note GS9)	" "
Pre employment health screening (guidance note MS20)	" "
Safety in the use of timber pallets (guidance note PM15)	" "
Working platforms on fork lift trucks (guidance note PM28)	" "
Manual Handling Leaflets IS/168 series	The Royal Society for the Prevention of Accidents, The Priory, Queensway, Birmingham B4 6BS
Safe Practices Associated with Loading and Unloading of Vehicles	British Fibreboard Packaging Employers Association, 5/6 Argyll Street, London W1V 1AD
Safe systems of work for paper making machines	The Paper and Board Industry Advisory Committee. Available from HMSO and Government bookshops.
Code of practice for Use of Static Racking	Storage Equipment Manufacturers Association, 7 Ludgate Broadway, London EC4V 6DX
Code of practice for Design of Static Racking	" "

Appendix 1 An example of a set of rules to govern the operation of overhead travelling cranes (as used by one large group of companies)

1 A crane driver shall be certified fit annually by the Company's Medical Officer, and shall be registered by the Personnel Department as a crane driver.

2(a) No person shall be allowed on the crane without the driver's consent. In the event of any breach of this rule, the driver shall stop his crane and report to his supervisor.

(b) The driver must not under any circumstances allow anyone to ride the hook.

3(a) The driver shall operate only on signals from a person authorised.

(b) The driver shall not move a load until he is satisfied that no one is in danger.

(c) The driver shall take all reasonable action to avoid the carrying of loads over persons on the floor.

(d) The driver must not move the crane with slings trailing from the crane hook in a dangerous manner.

(e) The driver shall sound his bell to warn persons who are in any position of danger and shall not proceed until his signal is acknowledged.

4 The driver shall not wilfully overload the crane: he shall reject any load which in his opinion, is greater than the safe working capacity of the crane, and he shall notify his supervisor of the circumstances.

5 At the commencement of each shift the driver shall: (a) Check there is no load on the crane hook. (b) Test the overwind "cut out" on no load. (c) Test the brakes. (d) Check that fire extinguisher is in position on the crane. (e) Check all materials, tools, loose parts or rubbish, are cleared from the platform, and cabin, by reference to his Supervisor if necessary, before starting the crane.

6 The hoist "cut out" is provided only as a safety measure to prevent over-running under emergency conditions. The hoist must always be stopped before reaching its highest position and particular care must be taken when raising the hoist unloaded.

7 Reversing in cross travel, long travel and hoist motions, must never be used for stopping other than in the case of extreme emergency.

8 Should any defect appear in the controller mechanism, the driver shall immediately put the main feed switch in the "off" position, fix "Do Not Start," tag on switch and lock the switch in the "off" position and report the defect to the Maintenance Department and his Supervisor.

9(a) The driver shall, as far as practicable, position the crab of the crane so that the load is lifted vertically.

9(b) Should the hoist rope become slack or ride out of the winding drum grooves or sheaves, the driver shall report the matter to the Maintenance Department and his Supervisor, so that a check on the wire rope can be carried out after winding back.

10 The driver must report immediately to his Supervisor if any bolts or rivets are missing from the crane structure or rail fish plates, etc.

11 The driver shall not carry out any mechanical or electrical repairs or adjustments to his crane. Any defects must be reported immediately to the Supervisor.

12 If any authorised persons are on the crane, the driver shall not move his crane without the agreement of that person or persons.

13 The driver shall always use the access ladders. If the driver is unable for any reason to bring the crane to the access ladder, he shall wait until effective safe means are provided for him to leave the crane.

14 On leaving the crane, the driver shall switch off the cabin isolator and at all times when a crane is left unattended, the main isolator switch must be in the "off" position, except pendant operated cranes.

15 A driver instructing a trainee shall hold himself ready to assume instant control in the event of any errors on the part of the trainee and shall not at any time leave him alone in charge of the crane until the trainee is considered competent by supervision. A trainee must be over 18 years of age.

16 (Extract from the Factories Act, Section 27, Item 7).

"If any person is employed or working on or near the wheel-track of an overhead travelling crane in any place where he would be liable to be struck by the crane, effective measures shall be taken by warning the driver of the crane or otherwise to ensure that the crane does not approach within 20 feet of that place."

The following action must be taken:-

1 The power shall be switched off, the isolator switch locked off and a **'Do Not Start'** tag hung n the switch.

2 If it is not practicable to do this then stop blocks must be fitted on the rail tracks at least 20 feet away from where the men are going to work.

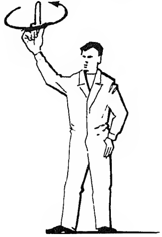
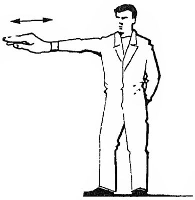
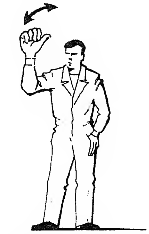
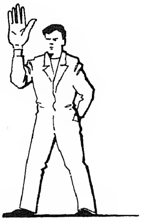
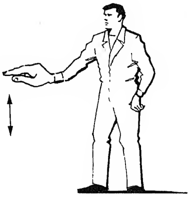
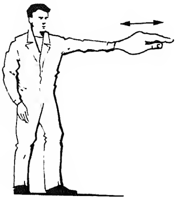
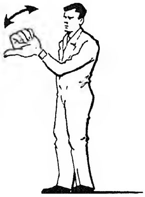
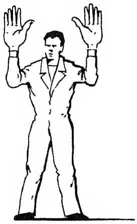
N.B. The Supervisors of the men concerned and of the Department where the men are working are jointly responsible for this. The ultimate responsibility for ensuring that the above conditions are complied with, rests with the Supervisor of the persons working on or near the wheel tracks.

Where there is any danger to persons working above floor level and they are liable to be struck by the frame or other part of the crane, the driver shall not operate his crane until a safe system of working has been instituted.

Note

When preparing instructions for the use of overhead travelling cranes or reviewing existing rules, reference should always be made to BS 5744: 1979 *Safe Use of Cranes* — particularly Section 1, paras 7, 11 to 16. Failure to comply with these requirements could lead to the adoption of unsafe practices.

Appendix 2 Hand signals recommended by the Royal Society for the Prevention of Accidents for use in Crane Operations

HOIST MOTION	LONG TRAVEL	CROSS TRAVEL	ALL MOTIONS
			
LIFT	TO RIGHT	AWAY FROM DRIVER	STOP
			
LOWER	TO LEFT	TOWARDS DRIVER	EMERGENCY STOP

Appendix 3 Telecommand controlled cranes

Design criteria for enhanced safety

1 Overhead travelling cranes may be controlled by radio, induction or other nonconductive (e.g. infra red) means. The equipment used for this should always incorporate the following features:-

(a) it should have a key switch or equivalent security device to prevent unauthorised use of the transmitter;

(b) when in use it should send a continuous secure signal which the receiver can identify. (A signal is regarded as secure only when it includes at least three characteristics which are separately recognisable by the receiver);

(c) the crane operation should shut down automatically if the secure signal is not identified by the receiver for a period exceeding two seconds;

(d) an emergency stop system should be incorporated which is not dependent on the shutdown system specified at (c);

(e) the transmitter should be so constructed and enclosed as to withstand rough handling. A carrying harness, belt, shoulder strap or lanyard should be provided to enable the operator to wear the transmitter.

2 Operation of the crane will shut down, by reason of (c) if the distance between the crane receiver and transmitter exceeds the range of the nonconductive link. Consideration should be given to providing a definite limit to the range, thereby limiting the maximum distance between the operator and the crane. Any means for adjusting a definite limit should not be accessible to the operator.

3 It is recommended that the crane be fitted with a means for giving warning that it is under telecommand.

Appendix 4 An example of a set of rules for the safe operation of internal power operated trucks (as used by one large group of companies)

1 Authorised drivers

(a) Only persons holding a signed Drivers' Certificate of Authority, other than trainees under supervision, may operate Power Trucks and only in accordance with the terms of their certificate.

(b) No one shall be trained to operate a truck unless he or she has previously been certified medically fit to do so by the Company Medical Officer.

(c) An authorised driver must be over 18 years of age and be registered with the Personnel Department, or company equivalent, as being competent to drive the trucks listed on the Certificate of Authority.

2 Responsibilities

The driver is responsible at all times for the safe operation of the truck.

3 Daily checks

At the commencement of each shift the incoming driver must:

(a) Check the condition of the truck as recorded by the previous driver in the Log Book.

(b) Check the following
  (i) position of all the controls
  (ii) the fire extinguisher if fitted
  (iii) brakes, steering, horn, hydraulic system, chains, forks, seats, tyres, visible electric cables and check for oil leaks. (Also fuel supply and raidators with L.P. gas, petrol and diesel trucks).

(c) Before moving the truck
  (i) remove dirt and dust
  (ii) make certain the immediate area is clear

4 Unsafe trucks

A truck must not be driven which is unsafe through failure of any of the following items; brakes, steering, horn, hydraulic system, chains, forks. These items are listed in the Log Book. Should a fault develop in a truck during operation, it should be parked as safely as possible and the fault reported to the Supervisor/Maintenance Department. Details should be entered in the Log Book.

5 Starting up

If petrol or L.P. gas trucks refuse to start, the carburettor must not be warmed nor the air intake blocked. It must be reported to the Supervisor/Maintenance Department.

6 Driving the truck

When driving the truck it is essential:

(a) to keep all parts of the body within the framework of the truck.

(b) (i) to ensure the immediate area is clear before moving off either forward or in reverse.
  (ii) to look in the direction of travel whether forward or in reverse.

(c) to ensure movements are made smoothly and at safe speeds.

(d) (i) with High Lift Trucks, to travel with the mast tilted back and the load at the lowest possible position consistent with the ground over which the truck is travelling.
  (ii) with empty trucks to travel with the forks parallel to, and as near to the floor as possible.

(e) never to tilt the mast forward when carrying a load, except when placing the load on a stack or platform.

(f) never to brake or turn suddenly, except in an emergency.

(g) (i) when approaching corners, crossings and side entrances to slow down, sound horn, be prepared to stop, then proceed with caution.
  (ii) before driving through doorways, to STOP, sound horn, then proceed with caution.
  (iii) that the horn should be used as a warning of the truck's approach, not a command to clear the way.

(h) never to move a load greater in weight than the rated capacity as shown on the truck.

(j) (i) to spread the forks to suit the pallet or load.
  (ii) to centralise the load on the forks.
  (iii) when travelling, that the load is at the heel of the forks.

(k) when carrying bulky loads which obstruct forward vision, to drive in reverse keeping a good lookout in the direction of travel.

(l) before passing under doorways or other places with low headroom, to make sure there is enough overhead clearance.

(m) to avoid reversing the direction of the truck by means of gear or direction control lever, without first bringing the truck to a halt.

(n) to avoid turning with an elevated load.

(o) to avoid turning on ramp or slope.

7 Stacking

When stacking, drivers shall:

(a) conform to the Company's Rules with regard to the correct method of stacking materials.

(b) always look up before lifting forks or load to ensure there is overhead clearance for the load and/or mast.

(c) apply hand brake before lifting, tilting and lowering loads.

(d) ensure the load is safely stacked before withdrawing the forks.

(e) on High Lift Trucks, avoid sudden movements of tilt and side shift when load is elevated.

(f) take extra care if forks protrude beyond the load.

8 Road vehicles

When loading or unloading vehicles the driver shall:

(a) ensure that the vehicle driver is aware of his presence. (The vehicle engine should be switched off and the parking brakes applied).

(b) in the case of free-standing trailers ensure the hand brake is on and a supporting trestle is in position (where applicable).

(c) never use a Rider Operated Truck amongst road vehicles unless it is fitted with a back guard.

(d) avoid operating on a slope if possible, but if it is necessary, the vehicle should be parked across the slope with the truck working up and down.

9 Cleanliness

Truck drivers are responsible for truck cleanliness.

10 Unsafe loads

(a) The driver shall not move any load unless he is satisfied that it is safe to do so. If in doubt he must report immediately to the Supervisor for instructions.
(b) No more than one palletised load may be carried on the forks unless local management have issued specific instructions laying down the safe method to be followed.
(c) No loosely stacked load may be carried unless it is restrained in some manner approved by local management.

11 Passengers

The carrying of passengers either on the truck or forks is prohibited unless a seat or properly designed platform is provided and the agreed safe system of operation is implemented.

12 Pedestrians

Truck drivers must give way to pedestrians at all times.

13 Ramps

(a) When ascending ramps the load must be in front of the driver. (Extra precautions may be necessary with bulky loads).
(b) When descending ramps the load must be behind the driver.

14 Railway lines and gullies

Railway lines and gullies should always be crossed at an angle, i.e., one wheel at a time.

15 Unattended trucks

An unattended truck must always be immobilised by removing the key or plug to prevent unauthorised operation.

16 Area of operation

Powered trucks must not be driven on the Public Highway unless:

(a) the truck is licensed under the Road Traffic Act 1972, and suitably insured.
(b) the driver holds a valid driving licence issued under the same act.
(c) specific instructions have been given to do so.

17 Accidents

Any accident involving personal injury or damage to plant, must be reported immediately to the Supervisor giving details of injury, damage, time and place, etc. A note of the circumstances should be entered in the log book on the page provided.

18 End of shift

At the end of the shift the driver must:

(a) park the truck in a safe position.
(b) apply hand brake.
(c) (i) with High Lift Fork Trucks lay the forks flat on the ground with the chains still under tension.
(ii) all other High Lift Trucks — ensure attachments are lowered to the ground with the chains still under tension.
(d) put all controls at neutral, switch off power and/or fuel and remove ignition key or starter circuit key.
(e) FILL IN THE LOG BOOK.

19 Additional rules for reel clamp trucks

(a) The fixed blade of the clamp should, whenever possible, be on the driver's side of the truck when approaching or leaving a stack.
(b) Reels must be stacked true and vertical and be of equal diameter in any one stack.
(c) (i) reels with a deckle (length) less than the width of the truck may be carried horizontally or vertically, but if forward vision is obstructed the truck MUST be driven in reverse.
(ii) in stacking areas where space is restricted, reels wider than the truck should be carried vertically and the truck driven in reverse.
(d) When picking up a reel from a stack, the driver must pause to ensure the reel is safely clamped.
(e) End stacking of the following is completely prohibited:
  (i) wrapped reels of paper with pleated pack ends.
  (ii) unwrapped reels which are not banded or firmly stuck.
  (iii) reels with projecting centres or plugs.
  (iv) reels with ends which are not flat (dished).
  (v) reels under 18" diameter.

(f) When stacking and unstacking particular attention must be paid to overhead clearances and to ensuring the clamp is clear of adjacent stacks.

(g) The height of stacks must never exceed the Standards shown on the charts displayed in the stacking area.

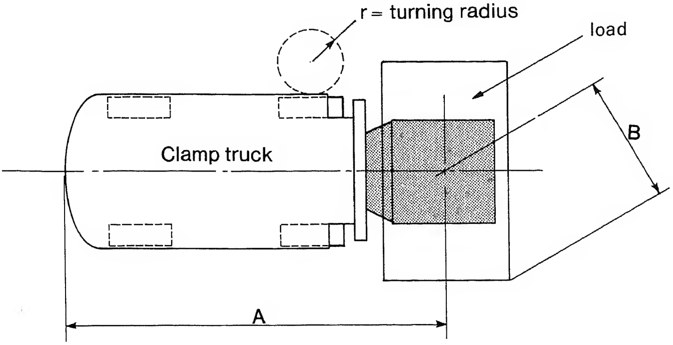
(h) With small deckle reels more than one may be carried at one time provided they are of equal diameter and can all be gripped by the clamp blades and that no more than half the deckle of any one reel projects beyond the length of the blade. When lifting vertically, particular care should be taken to ensure the lowest reel is securely gripped.

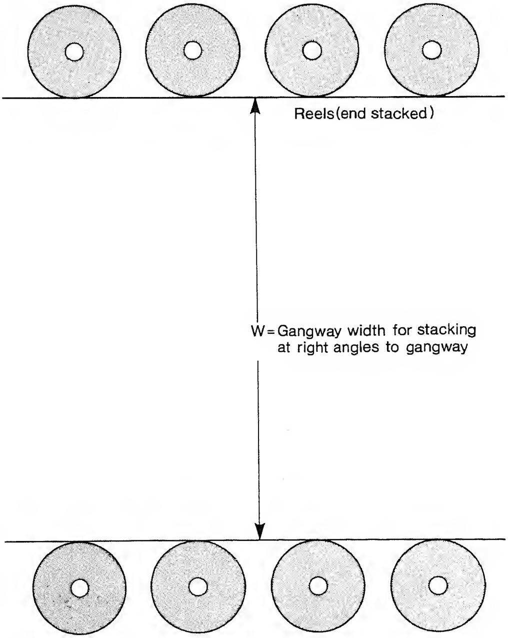
20 Additional rules for pedestrian operated trucks

The driver should:

(a) always walk facing the direction of travel with the operating control at arm's length.
(b) never ride on the truck unless it is specially designed for that purpose.

Appendix 5 Method of determining minimum width of stacking aisles



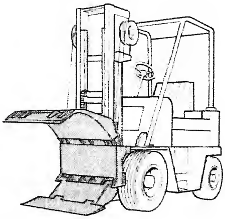


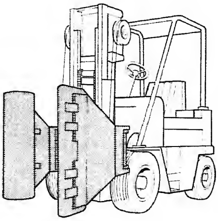
$$W = A + B + 10\%(A+B) + r$$

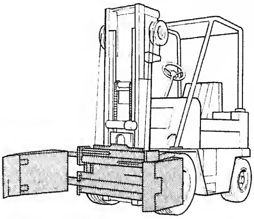
Example A = 1800mm
B = 800mm
A+B = 2600mm
r = 100mm
Therefore+ W = 2600mm + 260mm + 100 mm + 2960mm

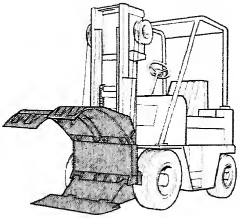
Appendix 6 Truck attachments

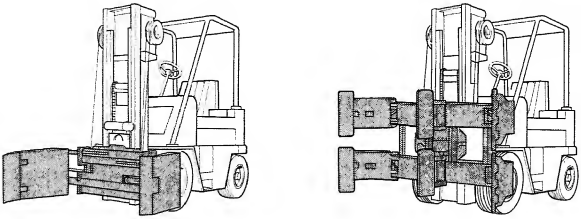
Truck attachments

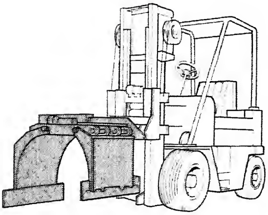

Kraft paper reel clamps

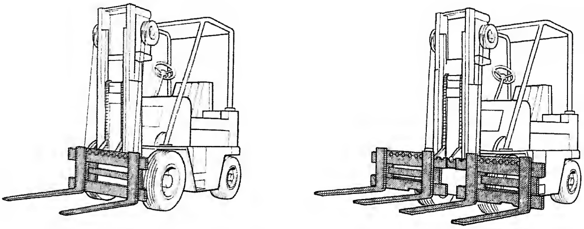

Tissue paper reel clamps


Sliding arm paper reel clamps


Split reel clamps


Two and four reel paper reel clamps


Paper reel upenders


Dual and triple side shift carriages

Appendix 7 Safe loading of reels

The size, shape and nature of reels makes movement comparatively easy but unless properly controlled, loading can be hazardous.

For safe loading and subsequent transportation, the following practice should be followed. Ensure that:

(a) the vehicle or trailer flooring is in a safe conditon i.e. no holes, not badly worn, nor rotted;

(b) the front scotch is placed so that the reels when loaded are close to, but not touching, the headboard and the tie ropes are secured as soon as the front reels are in position;

(c) each reel is securely wedged with the correct sized wedge, i.e. large reel/large wedge — small reel/small wedge;

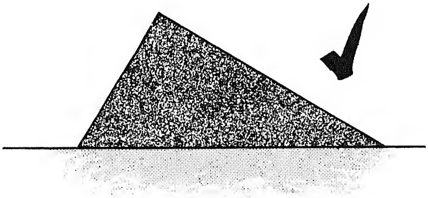
(d) the wedges are placed correctly, with the longest plane to the platform:

(e) the back scotch is placed in position under the last reels as illustrated below and the tie ropes secured. The back scotch must always be fully resting on the platform of the vehicle or trailer;

(f) over-ropes, when used, are in good condition and always used in pairs. They must not be knotted or repairs improvised;

(g) after sheeting, the front and the back of the load is cross-roped and the body of the load roped between each pair of reels from side to side across the vehicle;

(h) when trailers are being used a trestle support is placed under the front if the cab unit has been uncoupled, and the trailer hand brake has been applied.



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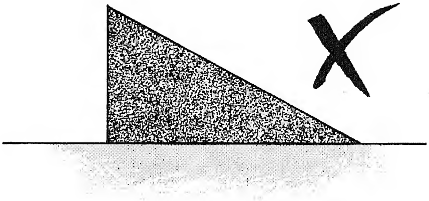

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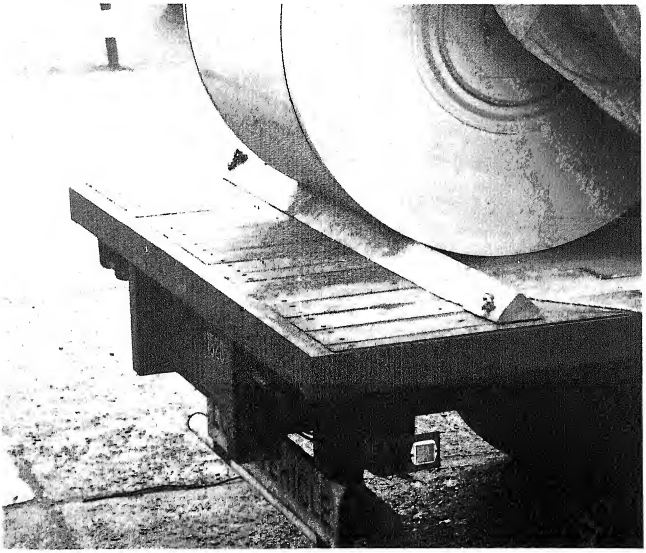
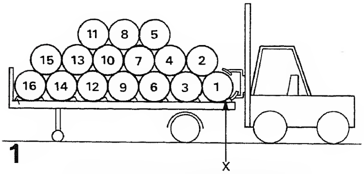


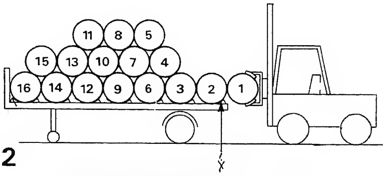
Back scotch placed under last reel

Appendix 8 Unloading lorries and trailers by means of reel clamp truck



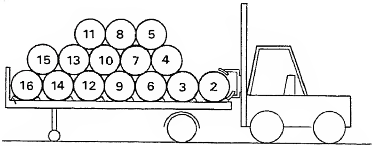
1

Place blades on back of vehicle close to Reel 1.
Remove wedges at X, grip reel 1 with blades.
Move slowly back allowing reel 2 to follow and
drop in behind reel 1.



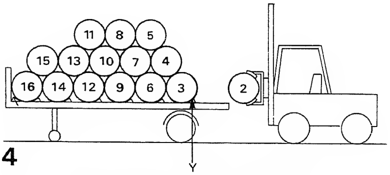
2

With truck and reel 1 still holding replace
wedges at X. Take away reel 1.



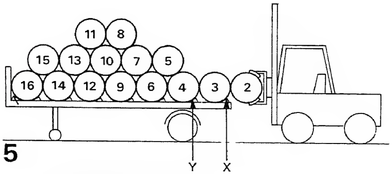
3

Return, grip reel 2 as with reel 1. Fig.A.



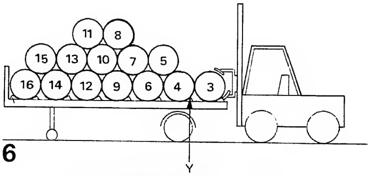
4

Move back to allow sufficient room to break down
reels 3, 4, and 5.
Brakes firmly applied on truck



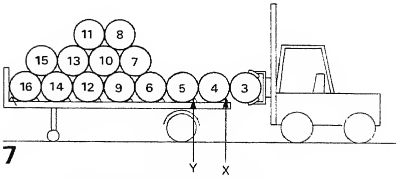
5

Remove wedges at Y Fig.4.
Bar down 3, 4 and 5. One man each side – allowing
3 to run up to 2. Move slowly back until 3 and 4 are
on vehicle with 5 on 4.
Replace wedges at X and Y take away reel 2.



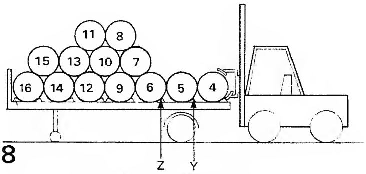
6

Return, grip reel 3 as with reel 1 Fig.1
Remove wedge Y, move slowly back bringing 4 and
5 down Fig.7



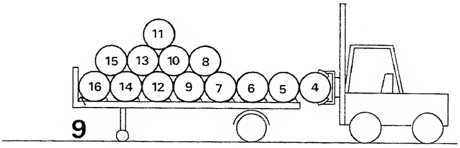
7

With truck and reel 3 still holding reel 4 replace
wedges at X and Y
Take away reel 3



8

Return grip reel 4 as with reel 1 Fig.1.
Remove wedges Y and Z. Move slowly back allowing
5, 6, 7 & 8 to follow.
Backing down 6, 7, 8 – one man each side to position
in Fig.9.



9

With truck and reel 4 still holding reel 5 replace
wedge at X, Y and Z. Take away reel 4.
The same sequence of operation to be followed for
remaining reels, taking particular care to replace
retaining wedges at the appropriate stage of the
operation.

The method of unloading illustrated on this chart, must be followed at all times.

Extra care should be exercised during adverse weather conditions, where unloading has to take place in the open, to counteract the possibility of the truck being pushed back or skidding on a wet or slippery surface.

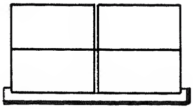
Before unloading commences a check must be made to ensure that wedges are in position against all reels in the bottom tier. (Note - it may be necessary to partly free the wedges as they sometimes become tightly wedged during transit).

Where a driver is present he shall be responsible for the unloading of the vehicle, particularly the breaking down of the tiers of reels.

The *unloading team* shall consist of three men. When the driver is present - truck driver, lorry driver and an assistant provided by those taking delivery of the reels. When no driver is present - truck driver and two men provided by those taking delivery of the reels.

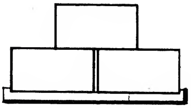
On no account shall the men, provided by the receiver, stand on the deck of the vehicle when barring down and moving reels.

Where reels are loaded more than one across the vehicle, thus -



or where a load consists of reels weighing over 1 ton each they must not be loaded more than 2 tiers high - and a three man team *must* be made available for unloading

For clamp truck unloading reels must not be loaded thus -

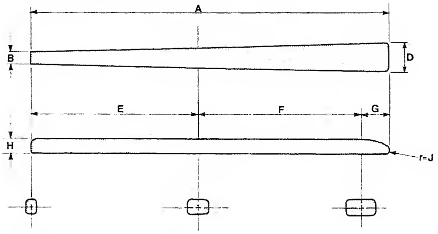


In the case of trailers the unit must be left coupled or a trestle support must be placed under the front and the handbrake must be applied.

Appendix 9 Manual unstacking (breaking down)

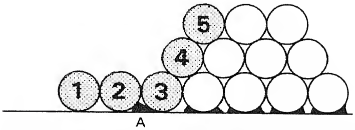
Where it is *absolutely necessary* to break down a stack of reels manually, it should be done by two men using podgers such as those shown below.

	A	B	C	D	E	F	G	H	J
Smaller model	1100	30	60	95	510	500	90	43	10mm
Larger model.	1700	30	75	130	785	800	115	48	15mm

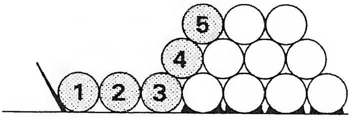


The edges have to be well rounded

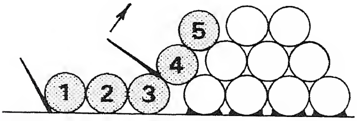
The sequence of operations should be:-



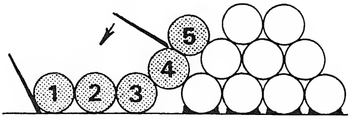
1 Set two reels in front of the stack to act as brake reels. STACK NOT TO BE MORE THAN THREE HIGH.



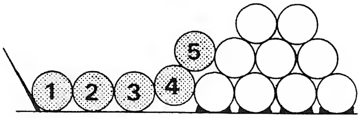
2 With the first man in front of the forward brake reel, holding the reels with a podger (larger size) – the second man removes the wedges at 'A'.



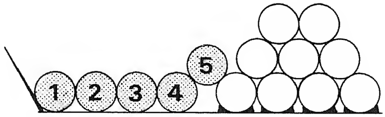
3 Second man, at side of stack, now assists reels 3 and 4 forward and down using a smaller size podger. First man controls forward movement of reels 1 and 2.



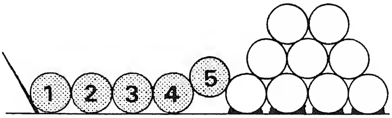
4 Continue assistance and control as at 3 above.



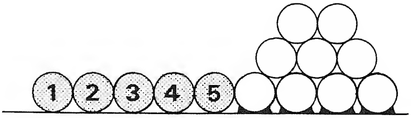
5 Control can now be exercised by first man once the reels reach the position shown.



6 as 5



7 as 5



8 Reels 1, 2 and 3 can now be removed leaving reels 4 and 5 to act as brake reels when sequence begins again.

Appendix 10 End stacking - stability

		Reel diameter- millimetres															
		500	*550*	*600*	*650*	*700*	*750*	*800*	*850*	*900*	*950*	*1000*	*1050*	*1100*	*1150*	*1200*	*1300*
Deckle - millimetres	*Up to 400*	9	11	12	13	14	14	14									
	500	8	8	9	10	11	12	12	13	14	14						
	600	7	7	8	8	9	10	10	11	12	12	13	14	14			
	700	6	6	6	6	7	8	8	9	9	10	11	12	12	13	13	14
	800	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	13
	850	5	5	5	6	6	7	7	8	8	8	9	9	10	10	11	12
	900	4	4	5	5	6	6	7	7	8	8	8	9	9	10	10	11
	950	4	4	5	5	5	6	6	7	7	8	8	8	9	9	10	10
	1000	4	4	4	5	5	6	6	6	7	7	8	8	8	9	9	10
	1050	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9	9
	1100	4	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9
	1150	3	3	4	4	4	5	5	5	6	6	6	7	7	8	8	9
	1200	3	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8
	1300	3	3	3	4	4	4	4	5	5	5	6	6	6	7	7	8
	1400	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7
	1500	3	2	3	3	3	4	4	4	4	5	5	5	5	6	6	6
	1700	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	6
	1900	1	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5
	2100	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4

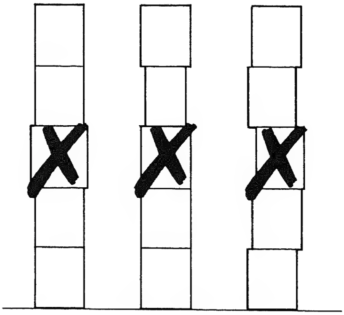
Table showing maximum recommended number of reels per stack.

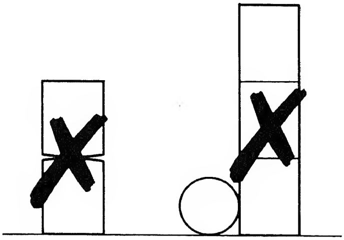
NB To ensure stability ratio of height to diameter should not exceed 8:1 more than 14 reels should not be stacked. When reels are stacked outside account must be taken of wind pressure and the height reduced accordingly.

Appendix 11 End stacking The construction and spacing of stacks

Building of stacks

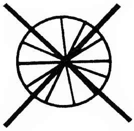
Wrong





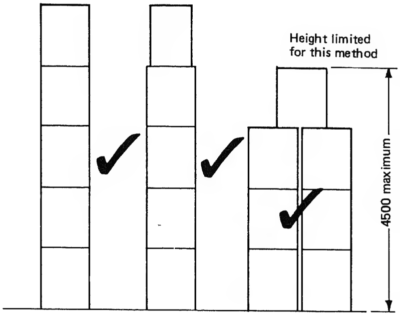
Reels with dished ends or protruding centres must not be stacked on end.

Reels must not be placed horizontally against a vertical wall



Wrapped reels with "pleated pack" ends must not be stacked on end.

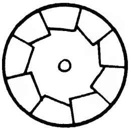
Right



Reels must be stacked true and vertical and be of equal diameter in any one stack, except that -

a reel with diameter slightly less than the other may be used as the top reel of a stack

All unwrapped reels must be banded or be firmly stuck, otherwise they must *NOT* be stacked on end.

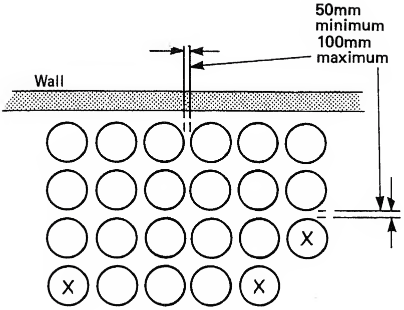


Wrapped reels with 'PMA' type end packing may be stacked on end.

Stacks should only be built on solid, firm, level floors (a maximum drainage slope of 1 in 66 is permissible)

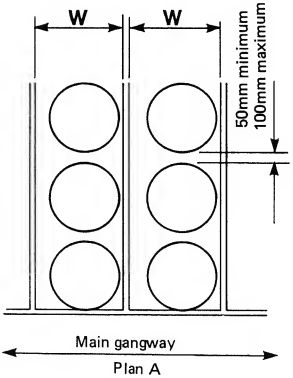
NO REEL BELOW 50 mm DIAMETER MAY BE STACKED OR STOOD ON END

End stacking
Spacing of stacks



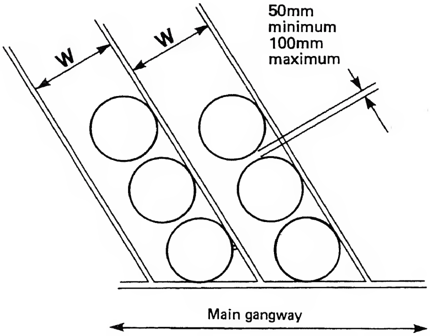
Block stacking should be adopted wherever possible.

Note - That with this system reel movement is limited to the open corners of the block ie only stacks 'X' can be worked by the truck.



Plan A

Stacks to be spaced such that row width 'W' relates to either the largest diameter reel in the row plus clearance for the clamp blades, or the width of the truck - whichever is the greater.



Plan B

The main gangway width is dependant on the truck size but it should be noted that stacking as in Plan 'A' requires a greater width than as in Plan 'B'

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